WAKE COUNTY, NC
TAMMY L. BRUNNER
REGISTER OF DEEDS
PRESENTED & RECORDED ON
08-08-2023 AT 08:53:00

BOOK: 019403 PAGE: 01065 - 01162

Instrument Prepared By:	Suzanne B. Allaire, K&L Gates LLP *(utilizing form drafted by the City Attorney's Office for the City of Raleigh)*
Brief Description for Index: County Registry	Hunters Pointe Subdivision, Book of Maps 2023, Pages 1311-1317, Wake
Parcel Identifier:	REIDs 0211476, 0031885 and 0031916
Mail After Recording To:	Development Services Department City of Raleigh Attn: Legal Document Review P. O. Box 590 Raleigh, N.C. 27602

DECLARATION OF MAINTENANCE COVENANT AND GRANT OF PROTECTION EASEMENTS FOR STORMWATER CONTROL FACILITIES

Required by City of Raleigh Code of Ordinances. Part 10, Section 9.2.2.G.2

City of Raleigh Case or File Number: RCMP-0356-2022, Z-52-20, SPR-0016-2022

Name of Development (as shown on recorded plat): Hunters Pointe

Legal Name of Declarant: Lennar Carolinas, LLC

Maintenance Covenant Number (For a Multi-Phase Development): N/A

Name of Owner's Association Responsible for Maintenance of Stormwater Control Facilities within the Development (if applicable): Hunters Pointe Owners Association, Inc.

Lot Number of Commercial Lot Owner Responsible for Maintenance of Stormwater Control Facilities (if applicable): N/A (as shown on map referenced in **Exhibit A**)

Submitted electronically by K&L Gates LLP in compliance with North Carolina statutes governing recordable documents and the terms of the submitter agreement with the Wake County Register of Deeds.

DECLARATION OF MAINTENANCE COVENANT AND PROTECTION EASEMENTS FOR STORMWATER CONTROL FACILITIES

Required by City of Raleigh Code of Ordinances, Part 10, Section 9.2.2.G.2

This Declaration of Maintenance Covenant and Grant of Protection Easements for Stormwater Control Facilities (this "Maintenance Covenant") is established this 3rd day of August, 2023, by Lennar Carolinas, LLC, the "Declarant" (as defined herein), who is the owner of certain real property located in Wake County, North Carolina, as described further in **Exhibit A** of this Maintenance Covenant (the "Property"), for the benefit of the Declarant, the Responsible Party (as defined herein), all successor Owners (as defined herein) of the Property, their successors, assigns, and heirs, and the City of Raleigh. (If the date above is blank, the effective date of this instrument shall be the date of its recordation in the county registry.)

RECITALS

WHEREAS, the City of Raleigh, under various state and federal laws, is required to regulate the maintenance of Stormwater Control Facilities (as defined herein) constructed to serve new development within the City's planning jurisdiction to ensure that, following initial construction, the Stormwater Control Facilities are operated, maintained, and, to the extent necessary, repaired in accordance with applicable state and federal law; and

WHEREAS, the City of Raleigh may be subject to substantial regulatory and financial penalties from the State of North Carolina and the federal government if the above-referenced rules and regulations are not applied to new development occurring within the planning jurisdiction of the City of Raleigh; and

WHEREAS, the City Council of the City of Raleigh has determined that, to maintain the City of Raleigh's compliance under applicable state and federal regulations, certain obligations are to be met by developers and subsequent owners of Stormwater Control Facilities constructed to benefit Owners of newly created Lots (as defined herein) in new developments; and

WHEREAS, Declarant, as Owner of the Property (which is part or all of the real property described in Book 19222, Page 1436, Wake County Registry), wishes to develop the Property in accordance with the rules, regulations, and laws of the City of Raleigh (including conditions of approval as shown in the aforesaid City of Raleigh Case Number) and the State of North Carolina; and

WHEREAS, Declarant intends to construct one or more Stormwater Control Facilities that will serve the Property and that will benefit more than one Lot within the Property (or any portion thereof), thus subjecting the Property to this Maintenance Covenant pursuant to the requirements of Section 9.2.2.G.2 of Part 10 of the City of Raleigh Code of Ordinances (hereinafter, Part 10 of the City of Raleigh Code of Ordinances is referred to as the "Unified Development Ordinance" or the "UDO".

WHEREAS, this Agreement has been procured in accordance with the requirements of N.C. General Statutes Chapter 143, Article 21, Part 1, N.C. General Statutes 160A-459, and Section 9.2.2.G.2 of the UDO.

NOW THEREFORE, in order to comply with the requirements of Section 9.2.2.G.2 of the UDO of the City of Raleigh, the Declarant hereby establishes this Maintenance Covenant in order to encumber, restrict, and obligate the Property and any successor Owners of the Property (or any portion thereof) to the terms, conditions, and obligations herein.

Article I
Definitions, Construction, and Amendment

1. Definitions. As used in this Maintenance Covenant, the following words and terms have the following definitions.

(a) "Association" is defined as the entity organized and operated under the laws of the State of North Carolina as the homeowners' or property owners' association for the Property (if applicable).

(b) "City" or "City of Raleigh" is defined as the City of Raleigh, North Carolina, a North Carolina municipal corporation.

(c) "City Approval" is defined as the written approval of the City of Raleigh, as given by the Director of Planning or their deputy on the applicable document or plat.

(d) "Code" is defined as the Raleigh City Code of Ordinances as it may be amended from time to time, and includes all duly adopted regulations, rules, directives, and policies of the City pursuant to or in furtherance of the Code.

(e) "Declarant" is defined as the Person identified as the Declarant hereinabove and its successors and assigns, and includes any Person who has the powers of a Declarant established in a Subsequent Document, and its successors, heirs, and assigns.

(f) "Development" is defined as the real property approved for development by the City under the City of Raleigh Case or File Number shown on the first page of this Maintenance Covenant. The Property may be part or all of the real property that constitutes the Development.

(g) "Governmental Authority" (or "Governmental Authorities") is defined as the City, the County (or Counties, if applicable) in which the Property is located, the State of North Carolina, the United States of America and all other governmental entities and quasi-governmental entities that have jurisdiction over the Property or any part thereof, and all applicable departments and agencies of any of them, whichever is/are applicable.

(h) "Lot" or "Parcel" is defined as any portion of the Property, together with any improvements thereon, which is shown upon any recorded plat of any part or all of the Property,

and which is not any of the following: dedicated street rights-of-way; or greenway, open space, or park lands owned in fee simple by the City.

(i) "Maintain", "Maintenance", "Maintaining", or any similar term used herein is defined to include any one or more of the following, as the context requires: acquisition, purchase, construction, re-construction, installation, maintenance, inspection, examination, upkeep, cleaning, renewal, alteration, repair, replacement, repainting, remodeling, restoration, removal, improvement, administration, operation, use, planting, mowing, cutting, trimming, pruning, fertilizing, watering and preservation.

(j) "Maintenance Covenant" is defined as this document, together with all exhibits and amendments to this document.

(k) "Owner" is defined as the record Owner, whether one or more Persons, of fee simple title to any Lot, but excluding those having an interest in a Lot solely as security for the performance of an obligation or a tenant.

(l) "Person" is defined to include any natural person, corporation, business trust, estate, trust, partnership, limited liability company, association, joint venture, Governmental Authority (including the City), or other entity.

(m) "Parcel" is defined as "Lot", above.

(n) "Property" (or "Properties") is defined as all of the real property which is subject to any part or all of the terms of this Maintenance Covenant, as described in **Exhibit A**, attached hereto, as it may be amended, and incorporated herein by reference.

(o) "Registry" is defined as the office of the Register of Deeds (or any successor office under applicable law) for the North Carolina County or Counties in which deeds, plats, easements, mortgages and deeds of trust for the Property are recorded. All references herein to recording or to any requirement to record a document or plat refer to recording in the Registry of the County or Counties in which the applicable portion of the Property is situated.

(p) "Responsible Party" is defined as an Association or a commercial Lot Owner that is responsible for Maintenance of the Stormwater Control Facilities following transfer of such responsibility from the Declarant to the Association or commercial Lot Owner by deed or easement. Until such point that the title to the Stormwater Control Facilities is transferred, by deed or easement, to an Association of commercial Lot Owner, the Responsible Party shall be the Declarant.

(q) "Stormwater Control Facilities" is defined as one or more of the following devices and measures, together with associated private drainage easements utilized for conveying stormwater (however identified on a plat or in a document) that serves the Property and which are located outside of public street rights-of-way and drainage easements accepted into public use by the City, including, but not limited to, conduits, inlets, channels, pipes, level spreaders, ditches, grassed swales, sand filters, wet ponds, dry detention basins, wetlands, permanently

protected undisturbed open space areas (or similarly designated areas, such terms to be used interchangeably in this Maintenance Covenant), bio-retention areas, retention or detention ponds, and other devices and measures, necessary to collect, convey, store, and control stormwater runoff and pollutants for more than one (1) Lot in the Property.

(r) "Stormwater Operations Maintenance Manual and Budget" or "Stormwater Operations and Maintenance Manual and Budget" is defined as that manual; however named, approved by the City and attached to and incorporated into this Maintenance Covenant as Exhibit C that documents the requirements for the Maintenance of the Stormwater Control Facilities and the projected annual costs for such Maintenance.

(s) "Subsequent Document" is defined as any document, map, or plat affecting or encumbering the Property or any portion thereof that is recorded in the Registry after this Maintenance Covenant is recorded in the Registry.

2. Applicability. The Property, this Maintenance Covenant and all provisions of Subsequent Documents and other separately recorded instruments applicable to the Property (or any portion thereof) are subject to the ordinances, regulations, and rules of the City, and shall be construed in accordance with all of the applicable provisions of the Code, whether or not such Code provisions are specifically referenced in this Maintenance Covenant or in any Subsequent Document. It shall be the responsibility of the Responsible Party and each Owner of each portion of the Property to comply with all provisions of the Code applicable to such portion of the Property. No Subsequent Document may avoid, vary, negate, or waive the obligations and rights of the Declarant, any Owner, or the Responsible Party without amendment to this Maintenance Covenant (with City Approval, as provided in Article I, Section 4) to allow such avoidance, variation, negation, or waiver.

3. Conflicts.

(a) The provisions of the Code control over any inconsistent provisions of this Maintenance Covenant or any Subsequent Document.

(b) As applicable provisions of the Code are amended, modified, revised, deleted, or moved to different sections, this Maintenance Covenant is deemed to be revised so as to conform to the provisions of the Code as they may exist from time to time and are applicable to the Property or any part thereof.

(c) The provisions of this Maintenance Covenant shall control over any inconsistent provisions of any Subsequent Documents unless this Maintenance Covenant is amended, with City Approval as provided in Article I, Section 4 below, to allow subordination of this Maintenance Covenant to the Subsequent Document. To the extent that any Subsequent Document affecting the Property conflicts with the provisions of the Code or the General Statutes of the State of North Carolina, the conflicting provision shall be automatically cured to comply with the Code and the General Statutes of the State of North Carolina. To the extent that the requirements of the Code and the General Statutes of the State of North Carolina conflict, the more stringent provision shall prevail and apply.

(d) Notwithstanding any other provision of this Maintenance Covenant, any provision of this Maintenance Covenant or Subsequent Document that is more restrictive than an applicable provision of the Code is not an inconsistent provision of this Maintenance Covenant unless the Code specifically provides otherwise, and is not deemed revised to conform to the Code.

(e) To the extent that definitions or provisions in a Subsequent Document are different than the definitions or provisions utilized in this Maintenance Covenant yet bear a similar meaning, the provisions of this Maintenance Covenant shall apply as if the defined term or provision of this document was utilized. Specific exceptions to this provision may only be achieved through amendment to this Maintenance Covenant as provided in Article I, Section 4.

(f) If additional Maintenance Covenants are recorded for the Development, those additional Maintenance Covenants shall have the priority of this Maintenance Covenant with respect to Subsequent Documents.

(g) Allocation of assessment obligations among Owners in any Subsequent Document does not constitute a conflict with this Maintenance Covenant. Provided, however, the rights of the City in this Maintenance Covenant, including, without limitation, the rights of the City to enforce liens and collect monies from Owners and any Association, shall not be impaired or adversely affected by any such allocation of assessment obligations in any Subsequent Document.

4. Amendment of Maintenance Covenant.

(a) Amendments to this Maintenance Covenant are valid from the time of recording in the Registry. Any amendment of this Maintenance Covenant must have prior City Approval. Any amendment of this Maintenance Covenant that requires City Approval is void *ab initio* if recorded without the required City Approval. Any amendment to an exhibit attached and incorporated into this Maintenance Covenant will similarly require an amendment to this Maintenance Covenant.

(b) During the first ten (10) year period following the date of the recording of this Maintenance Covenant in the Registry, the Declarant may amend this Maintenance Covenant with City Approval and without the consent or joinder of any other Person, so long as Declarant owns any portion of the Property.

(c) If the amendment provisions of Section 4(b), above, are no longer applicable to the Property, this Maintenance Covenant may be amended with the consent of two-thirds (2/3) of the Owners of Lots within the Property and with City Approval.

Article II
Obligations of the Raleigh City Code for Stormwater Control Facilities and Maintenance

1. Construction of Stormwater Control Facilities. The Declarant shall be responsible for the construction of the Stormwater Control Facilities and the Declarant will be responsible for the Maintenance thereof in accordance with the Stormwater Operations and Maintenance Manual and Budget prior to conveying title of the Stormwater Control Facilities, their appurtenances, and vegetation to the Responsible Party by deed or easement. The Stormwater Control Facilities must by constructed in accordance with all applicable laws, ordinances, regulations, rules, and directives of Governmental Authorities, including, but not limited to, the Code, and the Stormwater Control Facilities must perform as designed

2. Maintenance of Stormwater Control Facilities. Following conveyance to the Responsible Party by the Declarant, Stormwater Control Facilities shall be Maintained by the Responsible Party in accordance with the Stormwater Operations and Maintenance Manual and Budget . At all times, the Stormwater Control Facilities must comply with all applicable laws, ordinances, regulations, rules, and directives of Governmental Authorities, including, but not limited to, the Code, and the Stormwater Control Facilities must perform as designed. The Stormwater Operations and Maintenance Manual and Budget must meet all applicable requirements of the Code.

3. Location of Stormwater Control Facilities. A description of the portions of the Property where the Stormwater Control Facilities are located, including all private drainage easements conveying stormwater over, under, across, through, and upon the Property to and from the Stormwater Control Facilities, is provided in **Exhibit B**, attached hereto and incorporated herein by reference.

4. Drainage Easement. The Declarant dedicates, establishes and declares to and for the benefit of each Lot within the Property (or any portion thereof):

(a) the perpetual, irrevocable and non-exclusive easement, right and privilege to discharge, transport, and store stormwater from any portion of the Property into, over, under, across, through and upon the Stormwater Control Facilities and private drainage easements as described in **Exhibit B**, and

(b) the perpetual, irrevocable and non-exclusive easement, right and privilege to use and Maintain Stormwater Control Facilities, including the right of access to and from the Stormwater Control Facilities, including private drainage easements and other portions of the Property as reasonably necessary to Maintain the Stormwater Control Facilities; and

5. Relocation of Drainage Easements.

(a) Private drainage easements situated on the Property may be relocated only by a written agreement signed by the Responsible Party that is responsible for Maintenance of the Stormwater Control Facilities associated with such private drainage easements and by the Owners of all portions of the Property on which the private drainage easement then is located,

and by the Owners of all portions of the Property on which the private drainage easement is to be relocated. The consent of tenants, mortgagees, and beneficiaries and trustees under deeds of trust with respect to the affected portions of the Property shall not be required for the relocation to be effective. All relocations of a private drainage easement shall be accompanied with a letter sealed by a professional engineer licensed in the State of North Carolina stating that the relocated private drainage easement will not cause any adverse stormwater runoff unto the benefitted and/or adjoining properties.

(b) Notwithstanding anything herein to the contrary, no relocation of any private drainage easement shall be valid without prior City Approval. Any relocation without the required City Approval is void *ab initio*.

(c) Relocation of a private drainage easement is valid from the later of the time of either recording of the plat or other instrument of relocation in the Registry or such later date specified therein.

6. Stormwater Control Facilities Maintained by an Association.

(a) If an Association is responsible for the Maintenance of the Stormwater Control Facilities, then membership in the Association shall be mandatory for each Parcel served by the Stormwater Control Facilities and any successor Owner of the Parcel with membership being appurtenant to the Lot and running with ownership of the Lot. The Association shall have the power to levy assessments for the costs and expenses of Maintaining the Stormwater Control Facilities. All assessments required by this section that are levied against a Lot that remain unpaid shall become a lien on that Lot. (Calculation of the assessment charge shall be set forth in a subsequent recorded document.)

(b) Any Association that is the Responsible Party for the Maintenance of Stormwater Control Facilities shall be established in accordance with Chapters 47C or 47F of the North Carolina General Statutes (or successor statutes) and the Association declaration shall conform to this Maintenance Covenant and to Section 9.2.2.G.2 of the UDO (or its successor provision). Compliance with these terms shall be through Subsequent Documents executed and recorded by the Owners of the Property at a later date.

(c) If an Association is responsible for Maintaining the Stormwater Control Facilities, the costs and expenses of Maintaining any Stormwater Control Facilities (including any costs of complying with the terms of this Maintenance Covenant) shall be common expenses of the Association and shall include, without limitation, all costs for insurance premiums associated with the Stormwater Control Facilities and any other costs listed in the operations and maintenance budget established in the Stormwater Operations and Maintenance Manual and Budget.

7. Stormwater Control Facilities Maintained by a Commercial Lot Owner.

(a) If a commercial Lot Owner is responsible for Maintenance of the Stormwater Control Facilities, said Owner is responsible for making all repairs and replacements of the Stormwater

Control Facilities in accordance with the construction drawings approved by the City and the Stormwater Operations and Maintenance Manual and Budget.

(b) Each Parcel served by the Stormwater Control Facility and any successive Owner of any Parcel shall be subject to an assessment charge levied by the designated responsible commercial Lot Owner. The assessment charge shall include, without limitation, the actual costs for Maintaining the Stormwater Control Facility, all costs for insurance premiums associated with the Stormwater Control Facility, and other costs listed in the Stormwater Operations and Maintenance Manual and Budget. Calculation of the assessment charge shall be set forth in a subsequent recorded document. Any assessment charge levied against a Lot and remaining unpaid for a period of thirty (30) days or longer after the payment due date shall be delinquent and shall constitute a default of this Maintenance Covenant entitling the Lot Owner responsible for Maintenance of the Stormwater Control Facilities to bring an action at law against the defaulting party plus interest charges, together with all costs and expenses of collection incurred, such as without limitation, court costs and reasonable attorney fees actually incurred. Each Parcel Owner served by the Stormwater Control Facility shall have the right to Maintain, repair, and replace the Stormwater Control Facility if after forty-five (45) days written notice the commercial Lot Owner responsible for Maintenance, repair, and replacement fails to faithfully discharge its responsibility. The Parcel Owner doing the work shall have the same right as the designated commercial Lot Owner has to assess the other Lots served by the Stormwater Control Facility.

(c) At any time the commercial Lot Owner responsible for the Maintenance of Stormwater Control Facilities may assign its responsibilities and rights to a property owners association established in accordance with Chapters 47C or 47F of the North Carolina General Statutes or successor statutes, in which instance the Owners of the Parcels served by the Stormwater Control Facilities shall be members of the created property owners association.

8. Insurance. As part of the routine costs and expenses of Maintaining the Stormwater Control Facilities, the Responsible Party must procure and maintain liability insurance in an amount no less than $1,000,000.00 for the protection of the Stormwater Control Facilities.

9. Penalties Associated with Failure to Maintain Stormwater Control Facilities. Operation and Maintenance of the Stormwater Control Facilities must comply with all relevant provisions of the Code. Failure to Maintain the Stormwater Control Facilities in accordance with the Stormwater Operations and Maintenance Manual and Budget and any applicable regulation of a Governmental Authority is a violation of the Code and may subject each Lot Owner and the Responsible Party to significant daily civil penalties and other enforcement actions by the City of Raleigh and/or other Governmental Authorities, including assessments.

10. Joint and Several Liability. Each Owner shall be jointly and severally responsible for Maintenance of the Stormwater Control Facilities, including payment of any unpaid *ad valorem* taxes, public assessments for improvements, and unsafe building and public nuisance abatement liens charged against the Stormwater Control Facilities and Lots benefited by those Stormwater Control Facilities, and including all interest charges thereon, together with the costs and expenses of collection incurred by themselves (or other collecting agent), including court costs

and reasonable attorney's fees actually incurred. Each Owner has a right of contribution against all other Owners whose portions of the Property are served by the same Stormwater Control Facilities for payment of such costs and expenses to the extent that the Owner having such right of contribution pays more than such Owner's pro rata share thereof, such pro rata share being determined either by other assessment provisions for Maintenance of Stormwater Control Facilities established in Subsequent Documents or by dividing the acreage of such Owner's portion of the Property served by the Stormwater Control Facilities by the total acreage of the portion of the Property served by the same Stormwater Control Facilities when no maintenance assessments apply to the Property.

11. Permanently Protected Undisturbed Open Space Areas. Within any permanently protected undisturbed open space areas (and similarly designated areas) shown on any recorded plat of any portion of the Property, there must not be any land disturbing activity, any placement of impervious surfaces, any tree disturbing activity (as defined in the Code), any removal of vegetation, any new development or expansion thereof, or new use, construction, or encroachment without first obtaining a watercourse buffer permit from the City.

Article III
Rights Granted to City of Raleigh

1. Action for Specific Performance. Recognizing the consequences to the City of Raleigh of non-compliance with the obligations of this Maintenance Covenant, Declarant hereby grants the City of Raleigh the right to seek, in any court of appropriate jurisdiction, judicial action for specific performance of any of the obligations established within this Maintenance Covenant. This right of the City shall not limit any other remedies or enforcement options available to the City under this Maintenance Covenant, the Code, or any other applicable law, including later adopted ordinances or statutes that may supplement or supersede the requirements stated herein.

2. Grant of Easements.

(a) Declarant hereby dedicates and Grants unto the City a permanent, non-exclusive and irrevocable easement over the Lots, Stormwater Control Facilities, and private drainage easements for the purpose of permitting City inspection and, if deemed necessary, as determined by the City, in its sole discretion, for Maintenance and other work on the Stormwater Control Facilities (the "Protection Easement").

(b) Declarant hereby dedicates and grants to the City a permanent, irrevocable, and non-exclusive right of ingress, egress, and regress over and across all public or private easements on the Property, including, but not limited to, private roads, for Maintenance and other work on the Stormwater Control Facilities (the "Access Easement"). The rights granted to the City in this subsection shall extend to employees, agents, and contractors of the City.

3. Use of Protection and Access Easments. The City, its officers, employees, contractors and agents may access the Property and enter the Stormwater Control Facilities for purposes of exercising the City's rights hereunder. This Maintenance Covenant shall in no way obligate the

City to monitor and Maintain the Stormwater Control Facilities, and the City shall not be liable to any person, firm, partnership, company, corporation, governmental agency, or entity for the condition or operation of the Stormwater Control Facilities. Further, this Maintenance Covenant shall in no way diminish, limit, or restrict the right of the City to enforce any of its ordinances as permitted by law or to exercise any rights or powers granted to it.

4. City Right to Maintain and Repair Stormwater Control Facilities and Right of Reimbursement.

(a) If Stormwater Control Facilities serving any portion of the Property are not performing adequately or as intended or are not properly maintained or replaced, the City, in its sole discretion, may, after providing written notice to the Lot Owners and the Responsible Party, enter the Property and perform Maintenance of the Stormwater Control Facilities as is necessary to remedy the situation.

(b) The City shall be fully reimbursed for its costs of inspecting, monitoring, designing, constructing, repairing, reconstructing, replacing, and installing the Stormwater Control Facility or Stormwater Control Facilities. Such costs shall include the costs of administration, overhead, contracting, and public advertising associated with the work performed by the City pursuant to this Article.

(c) In addition to any other rights the City has to be reimbursed for its costs, the City may levy an assessment against each Lot served by the noncompliant Stormwater Control Facility. No assessment will be levied by the City without prior notice to the affected Lot Owners. Any unpaid assessment levied by the City shall be, as allowed by law, a lien against any delinquent Lot.

5. City Right to Private Assessments.

In addition to all other remedies set forth in this Maintenance Covenant, the Declarant assigns to the City any powers or rights of assessment that presently exist or that may be created (including those created through a Subsequent Document) for purposes of funding common expenses for services benefitting the Lots (including those of an Association and including any assessments for Maintenance of Stormwater Control Facilities). The Declarant also appoints the City as attorney-in-fact for the express purpose of assessing and pursuing the collection of unpaid costs incurred by the City in its Maintenance of any Stormwater Control Facility serving any of the Lots.

The City shall not exercise the assignment and appointment herein until all of the following occur:

(a) The City has not been fully reimbursed for any costs associated with Maintenance performed by the City (or its contractors) to any Stormwater Control Facility serving any portion of the Property.

(b) The City has provided the Responsible Party written notice requesting full payment and full reimbursement has not been made to the City within thirty (30) days of this notice.

(c) At least sixty (60) days prior written notice of the assignment of assessment rights is provided to the Responsible Party (and the members of the Association if an Association is the Responsible Party).

The Declarant further assigns to the City the right to compel the Responsible Party to ratify such assignment of assessment rights and appointment as are made in this section at a later date and to, if deemed necessary at the City's sole discretion, make a similar assignment in the future prior to the City commencing any Maintenance on any Stormwater Control Facility.

6. Provision of Membership Roster. If an Association is the Responsible Party, the Association shall, upon demand by the City, provide the City with a list of all members of the Association and the mailing address for each member that that the Association utilizes to communicate with its membership. This list must be provided within thirty (30) days of the City's demand.

7. No Public Adoption.

(a) The City's exercise of its rights under this Maintenance Covenant, or its abatement of a public nuisance, or its repair of unsafe structures does not constitute adoption of any Stormwater Control Facility by the City. The legal authority of the City is not intended to impede or prohibit the Responsible Party or any Lot Owners from taking all necessary actions to Maintain the Stormwater Control Facilities so that they function safely and perform the function for which they were created.

(b) The City is not obligated to monitor or Maintain any Stormwater Control Facility and the City shall not be liable to any person or entity for the condition or operation of any Stormwater Control Facilities.

Article IV
Subordination

1. Subordination.

(To protect the interests of the City of Raleigh and the public at large, any existing deeds of trust, mortgages, or liens encumbering the Property, other than property tax liens for the current tax year or governmental improvement assessment liens, must be subordinated to this Maintenance Covenant. If no such encumbrances exist, the following representation must be checked by the Declarant. Otherwise, such encumbrances must be listed and the Maintenance Covenant must be executed by the beneficiary and trustee (if trustee execution is necessary per the terms of the security instrument), mortgagee, or lien holder to evidence such subordination.)

[X] DECLARANT REPRESENTS THAT NO SUPERIOR DEEDS OF TRUST, MORTGAGES, OR LIENS (OTHER THAN PROPERTY TAX LIENS FOR THE CURRENT

TAX YEAR OR GOVERNMENTAL IMPROVEMENT ASSESSMENT LIENS) ENCUMBER OR AFFECT THE PROPERTY AT THE TIME OF THE EXECUTION AND RECORDING OF THIS MAINTENANCE COVENANT, OR THAT IF ANY OF THE FOREGOING EXIST AND ARE NOT BEING SUBORDINATED BY THE DEED OF TRUST BENEFICIARY AND TRUSTEE, MORTGAGEE, OR LIEN HOLDER BY EXECUTION OF THIS MAINTENANCE COVENANT, DECLARANT HAS AN OWNER'S POLICY OF TITLE INSURANCE THAT EITHER INSURES THE PROPERTY WITHOUT EXCEPTION FOR SUCH ENCUMBRANCE OR THAT PROVIDES AFFIRMATIVE COVERAGE WITH RESPECT TO SUCH ENCUMBRANCE AND, IN SUCH EVENT, A COPY OF SUCH TITLE INSURANCE POLICY HAS BEEN GIVEN TO THE CITY.

(If the box above is not checked, the subordination section on the signature pages must be completed and signed by the appropriate parties.)

Article V
Miscellaneous

1. Notice. Written notice as required hereunder shall be provided to the City of Raleigh at P. O. Box 590, Raleigh, N.C. 27602, Attention: Stormwater Program Manager and to the Declarant at 1100 Perimeter Park Drive, Suite 112, Morrisville, N.C. 27560. Once the Declarant transfers, by deed or easement, responsibility for Maintenance of the Stormwater Control Facilities to the Responsible Party, the address for notice to the Responsible Party shall be provided to the City in writing, directed to the address listed above. The City may elect to notify the Responsible Party at either (i) the mailing address for the Responsible Party provided to the Wake County Tax Assessor; or (ii) the registered agent of the Responsible Party on file with the Corporations Division of the Secretary of State's Office, either of which shall be deemed to comply with any notice requirements of this Maintenance Covenant. Where notice must be provided to individual Lot Owners (as members of an Association), such notice shall be sent to the Owner of that Lot as shown on the county tax listing first class mail. Written notice shall be deemed received four (4) days following its deposit, first class mail, with the United States postal system. All mailings required by this Article shall be sent via the United States Postal Service.

2. Term. This Maintenance Covenant shall continue as a servitude running in perpetuity with the Property.

3. Severability. If any provision of this Maintenance Covenant shall be deemed invalid by a judgment, order, or decree of any court of competent jurisdiction, such invalidity shall not affect any of the remaining provisions of this Maintenance Covenant.

4. No Merger. The rights, privileges and easements in this Maintenance Covenant shall not merge by operation of law or terminate but shall remain in full force and effect despite the fact that the same Owner may own title to all the real properties which are affected by this Maintenance Covenant.

5. No Waiver. The failure of any Owner, an Association, a Responsible Party, or the City in any one or more instances to insist upon compliance with any provision or covenant herein or to exercise any right or privilege herein shall not constitute or be construed as a waiver of such or any similar provision, covenant, right or privilege including the right to cure a breach or default, but the same shall continue and remain in full force and effect, as if no such forbearance had occurred.

Article VI
Execution

TO HAVE AND TO HOLD the covenants agreed to and the terms, conditions, obligations and restrictions imposed herein shall be binding upon the Declarant, its successors and assigns, and shall continue as a servitude running with the land in perpetuity. Declarant covenants that it is vested of the Property in fee simple, has the right to convey the same in fee simple, that the Property is free from encumbrances except as herein stated or subordinated herein, and Declarant will warrant and defend such title to the same against claims of all persons whatsoever. Title to the Property is subject to the following: all utility rights of way and easements recorded in the Registry; plats of any part or all of the Property recorded in the Registry; and restrictive covenants affecting any part or all of the Property that were recorded in the Registry prior to the recording of the deed to the Declarant that conveyed the Property to the Declarant.

Declarant acknowledges that the City of Raleigh is acting in reliance on Declarant's authority to enter into this Maintenance Covenant and the terms, conditions, obligations, and restrictions imposed herein in its authorization to subdivide the Property and in the issuance of any permits or development approvals associated with any construction of improvements on the Property and that the City of Raleigh may suffer irreparable harm from the violation of the covenants, restrictions, and obligations established herein.

[*The signature pages follow this page.*]

[Declarant Signature Page]

IN WITNESS WHEREOF, Declarant hereby executes this Maintenance Covenant under seal as of the day and year first above written.

DECLARANT:

Lennar Carolinas, LLC

By: _____ (SEAL)
Name: Robert Smart
Its: Vice President (Title)

NORTH CAROLINA

WAKE COUNTY

DECLARANT ACKNOWLEDGMENT

I certify that the following person personally appeared before me this day and acknowledged to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated: Robert Smart
(Print name of signatory in blank)

Date: January 20, 2023

My Commission Expires:
4-17-2025

_____
Notary Public
Print Name: Karen H Rozell

[Affix Notary Stamp or Seal]

KAREN H. ROZELL NOTARY * * * PUBLIC WAKE COUNTY, N.C.

[The next page is the subordination signature page.]

[Subordination Signature Page]

N/A, as Trustee, and N/A, as Beneficiary, under that certain Deed of Trust recorded in Book N/A, Page N/A N/A County Registry, North Carolina, join in this Maintenance Covenant for the sole purpose of expressing their consent hereto and of binding, subjecting and subordinating said Deed of Trust and their interest in the Property to the terms, covenants and conditions of this Agreement.

TRUSTEE:

N/A

By: _____ (SEAL)
Name: _____
Its: _____ (Title)

BENEFICIARY:

N/A

By: _____ (SEAL)
Name: _____
Its: _____ (Title)

[Notary acknowledgments for the Trustee and Beneficiary follow this page.]

NORTH CAROLINA

WAKE COUNTY

TRUSTEE
ACKNOWLEDGMENT

I certify that the following person personally appeared before me this day and acknowledged to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated: _____
(Print name of signatory in blank)

Date:_____

My Commission Expires:

_____

_____
Notary Public
Print Name: _____

[Affix Notary Stamp or Seal]

NORTH CAROLINA

WAKE COUNTY

BENEFICIARY
ACKNOWLEDGMENT

I certify that the following person personally appeared before me this day and acknowledged to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated: _____
(Print name of signatory in blank)

Date:_____

My Commission Expires:

_____

_____
Notary Public
Print Name: _____

[Affix Notary Stamp or Seal]

Attorney Certification:

I, Suzanne B. Allaire, an attorney licensed to practice law in the State of North Carolina, certify to the City of Raleigh that this Maintenance Covenant has been prepared in accordance with the instructions provided by the City of Raleigh, that I am familiar with the requirements of Section 9.2.2.G.2 of the UDO, and have prepared this instrument in accordance with the requirements of Section 9.2.2.G.2 of the UDO. If a deed of trust is being subordinated to this Maintenance Covenant and the signature of the trustee is not provided, I hereby certify that I have reviewed that deed of trust and verify that the terms of the deed of trust do not require trustee consent or signature for the subordination to be effective.

Attorney at Law

NC Bar #: 36587

Exhibit A
Description of Property

All Lots as shown on the subdivision plat recorded in Book of Maps 2023, Page 1311-1317, Wake County Registry.

Exhibit B
Description of Stormwater Control Facilities
and Drainage Easements

All areas shown and labeled as "Private Drainage Easements", "Stormwater Control Facility", or "Stormwater Control Measure" (or equivalent terms) on the subdivision plat recorded in Book of Maps 2023, Page 1311-1317, Wake County Registry.

Exhibit C
Stormwater Operations and Maintenance Manual and Budget

[The Stormwater Operations and Maintenance Manual and Budget follows this page.]

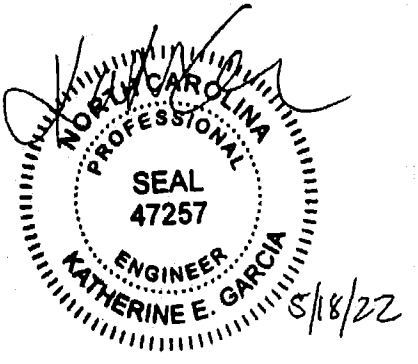
HUNTER'S POINTE

RALEIGH, NORTH CAROLINA

OPERATIONS AND MAINTENANCE MANUAL AND BUDGET FOR SCM A - WETLAND

PROJECT NUMBER: LEN-20060
DESIGNED BY: K. GARCIA, PE
S. DANIELL, PE

DATE: MAY 2022



McADAMS
2905 MERIDIAN PARKWAY
DURHAM, NORTH CAROLINA 27713
NC LIC. # C-0293

HUNTER'S POINTE

Operations and Maintenance Manual and Budget for SCM A - Wetland

General Description

The proposed Hunter's Pointe development is an approximately 32.4-acre proposed single-family development located north of White Kestrel Drive and east of Cashew Drive in Raleigh, North Carolina. The proposed Hunter's Pointe development site includes single-family home lots, roads, and associated infrastructure.

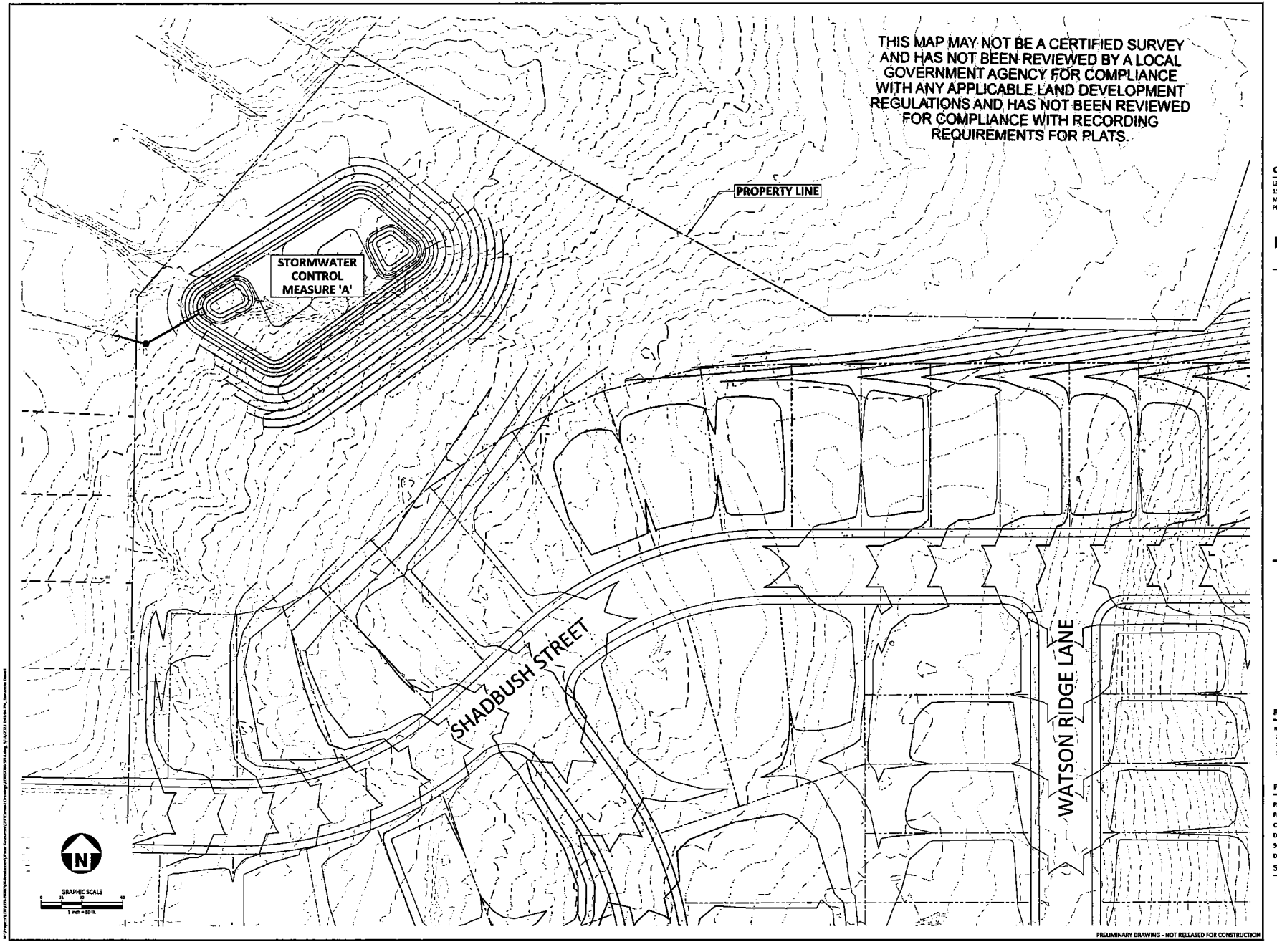
The proposed development drains to Harris Creek within the Neuse River basin. The proposed development shall be subject to the stormwater management requirements set forth in Section 9.2.2. of the City of Raleigh regulations. Per City of Raleigh regulations, stormwater management on this site shall address two primary issues: (1) peak discharge rates and (2) water quality management.

The proposed stormwater wetland is located east of the intersection of Toyon Drive and Cashew Drive. The wetland includes two deep pool sections with bottom elevations of 251.00'. The bottom elevation of the remainder of the wetland is 254.00'. The top of dam elevation is 258.00' and normal pool elevation is 254.00'. The primary outlet structure is a 4' x 4' riser box connected to 41 LF of 24" diameter RCP pipe. The outlet structure ties to an existing stormwater junction box. Plants to be used in the low marsh/shallow water portion of the wetland are as follows: Sweetflag, Pickerel Weed, Lizard's Tail, and Yellow Canna. Plants to be used in the high marsh/shallow land portion of the wetland are as follows: Swamp Sunflower, Soft Rush, and New England Aster.

For more details about the stormwater wetland please refer to the Hunter's Pointe construction drawings prepared by The John R. McAdams Company, Inc.

Operations and Maintenance

This manual contains detailed instructions for maintenance, operation, and inspection for the stormwater wetland. This manual also contains time intervals for these inspections and instructions for addressing any maintenance or repair issues. An inspection checklist has been included as well that should be used in all routine inspections of the stormwater wetland. This Operations and Maintenance Manual should be utilized as a guideline for inspection biannually, monthly, and after each runoff producing event wherein greater than 1-inch of rainfall occurs over a 24-hour period. A rain gauge should be kept onsite in order to determine when this rainfall event occurs. This guide should also assist in determining any needs for repair. The Operations and Maintenance Checklist should be utilized to conduct the required inspections. The checklist may then be cross-referenced with the Operations and Maintenance Manual to assist the inspector to determine any repairs or actions needed. This manual should not be used as a replacement for an engineer's evaluation of the facility's condition. Rather, this manual is to be used during cursory, routine inspections of the facility. Actual determinations as to the need for repair and the actual repair to be conducted are to be determined by an engineer qualified for the type of work involved.



McAdams
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

CLIENT

LENNAR
1300 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE
PRELIMINARY SUBDIVISION PLAN
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

REVISIONS

NO.	DATE	
1	06.25.2021	PER CITY OF RALEIGH COMMENTS
2	09.20.2021	PER CITY OF RALEIGH COMMENTS
3	11.03.2021	PER CITY OF RALEIGH COMMENTS

PLAN INFORMATION

PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWA
CHECKED BY	RCA
DRAWN BY	SDD
SCALE	1" = 30'
DATE	05.18.2022

SHEET

STORMWATER CONTROL MEASURE "A"

LOCATION MAP

1	MAINTENANCE OF EMBANKMENTS
2	SEDIMENT MONITORING
3	MAINTENANCE OF OUTLET STRUCTURES
4	MAINTENANCE OF WETLAND VEGETATION
5	RODENT / PEST CONTROL
6	PROPER WETLAND WATER BALANCE
7	OPERATIONS
8	ANNUAL BUDGET AND REPLACEMENT FUND
9	INSPECTION CHECKLIST
10	STORMWATER WETLAND DETAILS

SECTION I

MAINTENANCE OF EMBANKMENTS

I. MAINTENANCE OF EMBANKMENTS

A. Vegetation

The primary vegetative ground cover for all berm/embankments (excluding inside the wetland facility) is to be tall fescue. Proper maintenance of this cover will serve to prevent erosion while providing optimal access for inspection as well as preventing excessive sediment from entering the facility. Fertilization of this vegetation should be performed bi-annually in October and April with fertilizer (12-12-12) at a minimum rate of 12 to 15 pounds per 1,000 SF. Woody vegetation and trees should not be allowed to propagate on the dam embankments or top of dam. Trees and brush, if desired, are acceptable on embankments other than the dam. Inspection of embankment vegetation condition should be performed monthly or after every rainfall event greater than 0.5 inches of rainfall over a 24-hour period.

1. Seeding: Seeding should be accomplished by the use of a spiker and large tractor aerifier to ensure proper seed and soil contact along the top of banks. The temporary and permanent seeding schedules are shown on the stormwater wetland detail sheet, which has been included within this manual. Reseeding may be necessary in instances where initial seeding failed or existing areas have been compromised. The seeding schedules shown on the original design documents for the stormwater wetland should be followed for any necessary reseeding.

2. Mowing: All vegetative cover should be maintained below 6" in height. Due to the slope of the embankments, string trimmers (no mechanical mowers) must be utilized for mowing turf. Mowing and maintenance should be performed once a month to keep the maximum grass height below 6 inches and to maintain appropriate turf cover and health of turf.

B. Erosion

Erosion is initiated when vegetative cover is insufficient and/or concentration of runoff destabilizes vegetation. Runoff then tends to concentrate into channel flow, and soils tend to become entrained in the water and be transported downstream. Unsuitable fill material, inadequate compaction, and/or poor stabilization of vegetation can accelerate the erosion process. This has a negative environmental impact on downstream features, and has the potential to undermine the stability of the wetland facility. Erosion can be minimized with the proper care of vegetation and the use of appropriate methods to repair eroded areas and prevent recurrences of eroded areas. Appropriately, compacted soil meeting the berm design requirements will be placed in any gullies or rills, and then reseeded as described above. Re-occurrence of erosive problems should be addressed with appropriate geotextile fabrics that are installed according to manufacturer's instructions and per an engineer's recommendation. Uneven surfaces on the crest of the berm may lead to the formation of rills and/or gullies. It is possible to eliminate this problem by properly filling any depressed areas such that the entire top of berm is flat and level. Addition of fill to the top of berm should be completed by first preparing the existing soil such that a distinct boundary layer does not form beneath existing soil and newly placed soil. New fill should meet all soil requirements (as to material, placement, and compaction)

as stated on the original design documents for this structure. Inspection for erosion should be performed monthly or after every major rainfall event.

1. Abutment (or toe) areas: The location where the fill of the berm contacts the existing ground is the abutment (or toe). Erosive channels have a tendency to form in these areas. Appropriate geotextile fabrics, as mentioned above, may be necessary to prevent or stop this form of erosion from occurring. If significant erosion is evident, as determined by the owner, an engineer is required to provide a remedial fix.

C. Seepage

1. Detection: Soft wet areas and flowing springs are an indication of seepage. Early indicators of seepage include vegetation which is more robust than surrounding vegetation. Vegetation normally associated with wetland areas such as cattails, ferns, reeds and mosses may also indicate the initiation of seepage. The previously described abutment (or toe) area is a common location for seepage to occur. Another common location for seepage problems is the area where the outlet structure exits the berm section. This is especially true in cases where the soil around the barrel is not compacted properly. Another problem related to seepage may be indicated by the occurrence of 'boils' below the abutment of the dam. These boils are springs that tend to deposit soils. Locating the occurrence of any boils should be included in the bi-annual inspection of the facility. 'Boils' are a possible indication of piping and could lead to berm failure. Piping occurs when a void space is formed within the interior of the berm embankment. These void spaces tend to be preferred paths for water to travel, which will erode the interior of the berm and lead to failure.

D. Cracks, Slides, Sloughing and Settlement

1. Cracks: Large, well-defined cracks of greater than ¼" width indicate the potential for serious problems and the inspector of the facility should be alert for their presence. Cracks in the berm generally follow one of two patterns:

   - Transverse cracks appear perpendicular to the length of the berm and may be caused by differential settlement. Transverse cracks increase the likelihood of the formation of piping and seepage.
   - Longitudinal cracks appear horizontally along the berm and could serve as warnings to a future slide event. Longitudinal cracks that appear within the first six months of a newly constructed berms may be an indication of poor compaction techniques and poor foundation preparation.

2. Slides: Slides and slumps have the potential to critically undermine the integrity of the berm. Arch-shaped cracks that expose soil indicate the initiation of slides. Detection of slides by inspectors should be addressed in a timely manner and a geotechnical engineer should be contacted for consultation.

3. Settlement: Settlement of the soil in the berm reduces freeboard in large storm events and may even lead to overtopping. Differential settlement of the berm can also lead to the concentration of runoff and therefore erosion as mentioned above. For this reason the berm should be maintained uniformly to its original design elevation. Greater than six inches of settlement may be indicative of significant issues within the berm foundation and could lead to catastrophic failure. Indications of this degree of settlement necessitate inspection by a geotechnical engineer.

4. Inspections for cracks, slides, sloughing, and settlement should be performed biannually. Actions to take if any of the above is detected: Any of the problems mentioned above require that a geotechnical or civil engineer be contacted, and that corrective action be taken.

SECTION II

SEDIMENT MONITORING

II. SEDIMENT MONITORING

A. Stormwater Wetland

Accumulation of sediment within the wetland area should be kept to a minimum by stabilization of the wetland drainage area and proper prevention of erosion. Excess sediment accumulation within the wetland area will cause suffocation of the wetland vegetation, thus crippling the water quality function of the wetland. Inspection for sediment deposition should be performed biannually.

1. Check the depth at various points within the wetland, especially in the upland areas around the inlets to the wetland. Accumulated sediment will be removed semiannually or when the depth reaches 6 inches or more. A stake shall be set during construction to indicate 6 inches of sediment accumulation. The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

2. Removed sediment shall be disposed of in an appropriate manner and shall be handled in a manner that will not adversely impact water quality (i.e. stockpiling near the wetland or surrounding streams).

3. If the elevation of the marsh areas exceeds the normal pool elevation, the sediment shall be removed to design levels. This shall be performed by removing the upper 6 inches of soil and stockpiling it. Then, the marsh shall be excavated 6 inches below design elevations. Afterwards, the stockpiled soil should be spread over the marsh surface. The soil shall not be stockpiled for more that 2 weeks. Any dead or damaged wetland plants must be replaced after this process per the approved wetland planting plan.

B. Forebay

Accumulation of sediment within the forebay area should be kept to a minimum by stabilization of the wetland drainage area and proper prevention of erosion. Excess sediment accumulation within the forebay area will cause sediment transport to wetland area and subsequent suffocation of vegetation. Inspection for sediment deposition should be performed biannually.

1. Check the depth at various points within the forebay, especially in the upland areas around the inlets to the wetland. Accumulated sediment will be removed semiannually or when the depth reaches 6 inches or more. A stake shall be set during construction to indicate 6 inches of sediment accumulation. The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

2. Removed sediment shall be disposed of in an appropriate manner and shall be handled in a manner that will not adversely impact water quality (i.e. stockpiling near the pond basin or streams).

C. Principal Spillway System

1. If present, remove accumulated sediment from the outlet structure. The principal spillway system should be inspected for sediment accumulation monthly or after every rainfall event greater than 0.5 inches of rainfall over a 24-hour period.

D. Storm Drainage System

1. The upstream storm drainage system should be maintained along with the stormwater wetland. Trash from the site has a tendency to be washed into the storm drainage system and become lodged in the catch basins or pipes. The catch basins and pipes should be cleaned of debris at the time that maintenance is performed on the stormwater wetland. Sediment may accumulate in portions of the storm drainage system where slopes are relatively flat. This sediment may be washed out of the system, or flushed with a garden hose. Sediment should be flushed annually or as needed, as determined by the owner. Steps should be taken to trap this "flushed" sediment at the entrance to the wetland to prevent it from being deposited within the wetland.

E. Wetland De-watering

1. If the wetland is to be de-watered for sediment removal purposes, it shall be done in a manner that does not drop normal pool elevations more that one (1) vertical foot per day. A geotechnical engineer shall be present on-site during any wetland de-watering activities. If the basin must be drained for an emergency or to perform maintenance, then the flushing of sediment through the emergency drain shall be minimized to the maximum practical extent. Any dead or damaged wetland plants must be replaced after this process per the approved wetland planting plan.

SECTION III

MAINTENANCE OF OUTLET STRUCTURES

III. MAINTENANCE OF OUTLET STRUCTURES

The stormwater wetland is designed to pass stormwater quality storms through the low flow orifice located in the secondary outlet structure and larger storm events through the principal spillway. It is of vital importance that these structures remain unblocked so that the hydraulic functionality is not compromised. The outlet structure system should be inspected to ensure that it is functioning properly.

A. Low Flow Orifice

1. The stormwater wetland drawdown device for this facility consists of a 4-inch PVC inverted intake with a 1.25-inch diameter orifice drilled in the bottom and a PVC cap in the top. In addition to maintaining the normal pool elevation of the wetland, this device is responsible for drawing down the 1" water quality volume over a period of 2 to 5 days. However, in the event that the low flow orifice becomes blocked, the water level will rise to the elevation of the principal spillway, which means that the water quality benefits associated with the wetland are lost. The low flow orifice/inverted intake should be inspected for blockage monthly or after each major rainfall event. Debris causing the blockage should be promptly removed from the low flow orifice such that drawdown of the temporary pool occurs within 2 to 5 days, as designed.

B. Principal Spillway

1. The principal spillway for the stormwater wetland consists of a 4' x 4' square weir box structure attached to a 24-inch O-ring RCP barrel. The principal spillway is responsible for safely conveying larger storm events through the facility. The principal spillway system is expected to remain robust throughout the life of the stormwater wetland, but periodic inspection of the system is required. This inspection should occur biannually. The inspector should check for the presence of spalling, scaling, or cracking in the spillway system. Spalling is evident when pieces of concrete fall from the main pipe. It is defined as breaking, chipping, or fraying of concrete slabs that leave an uneven surface or edge, most often at joints or cracks. Scaling occurs when the surface of the concrete begins to flake off. The presence of cracking is indicated by separations in the concrete that are not located in the joints. Cracking can indicate the presence of structural problems and lead to leaks. Cracking can cause loss of the water tightness of the system, which can lead to piping (i.e. migration of soil particles into the pipe). If piping occurs, the risk of failure of the dam structure is greatly increased. Evidence of any of the above issues requires that an engineer be contacted for additional inspection to determine the need for repairs.

2. If the principal spillway system becomes blocked so that it does not operate at full capacity, the risk of dam overtopping or other uncontrolled releases may result. Therefore, to ensure hydraulic capacity of the spillways, the principal spillway system should be inspected for blockage monthly or after each major rainfall event. Any vegetative growth that occurs within the principal spillway system should be

removed promptly so that the full hydraulic capacity of the system is maintained.

C. Wetland De-watering

1. If the wetland is to be de-watered for principal spillway system maintenance purposes, it shall be done in a manner that does not drop normal pool elevation more that one (1) vertical foot per day. A geotechnical engineer shall be present on-site during any wetland de-watering activities. If the basin must be drained for an emergency, then the flushing of sediment through the emergency drain shall be minimized to the maximum practical extent.

SECTION IV

MAINTENANCE OF WETLAND VEGETATION

IV. Maintenance of Wetland Vegetation

A. Wetland Vegetation

1. Due to the construction process and the near "optimal" conditions required to establish wetland vegetation, it is very likely that a portion of the initial wetland plantings will not survive the first growing season due to factors such as lack of wetland hydrology, variable water levels, wetland plant selection, and sediment accumulations. Therefore, it is likely that additional wetland vegetation will be required during the initial stage of development of the wetland. Over longer periods of time, drought conditions or other factors may cause the wetland vegetation to die off and therefore need replacement. Any wetland vegetation requiring replacement should be in accordance with the original wetland-planting plan, which has been included in this manual. Substitutes to any of the wetland vegetation are acceptable as determined by a landscape professional or engineer.

B. Wetland De-watering

1. If the wetland is to be de-watered for wetland vegetation repair/maintenance purposes, it shall be done in a manner that does not drop normal pool elevation more that one (1) vertical foot per day. A geotechnical engineer shall be present on-site during any wetland de-watering activities. If the basin must be drained for an emergency, then the flushing of sediment through the emergency drain shall be minimized to the maximum practical extent.

SECTION V

RODENT / PEST CONTROL

V. ***RODENT / PEST CONTROL***

A. Embankments

1. Certain rodents including muskrats, ground hogs, and beavers tend to favor man-made earthen embankments as burrows. Evidence of the presence of such burrows requires the removal of the rodent and repair of any damage created by the presence of the rodent. Inspections for the presence of rodents within the embankment should be performed biannually.

SECTION VI

PROPER WETLAND WATER BALANCE

VI. PROPER WETLAND BLANCE

Crucial to the development of the stormwater wetland is the maintaining of a proper water balance. If the wetland is not sustaining an adequate water balance, steps should be taken to reestablish the appropriate wetland hydrology.

A. Well Pump

1. Due to the relatively small drainage area to the wetland, a well pump may be necessary to "irrigate" the wetland to sustain a normal pool elevation that is conducive to wetland plant growth and water quality functions. The well pump should be equipped with a float switch kit. When the normal pool elevation drops, the float switch would turn on the well pump, which would pump water into the wetland, until the water level returns to normal pool elevation. Once the water level has retuned to normal pool elevation, the well pump would automatically turn off. The well pump should also be equipped with an operating switch from which the well pump can manually turned on or off.

2. The normal pool elevation should be inspected during each trip to the wetland facility to ensure that it remains at the design level, and to ensure that the well pump, if installed, is operating properly. If at any time the inspector notices the normal pool elevation lower than design level, a well pump should be installed, or, if a well pump is already in use, it should be inspected to ensure proper operation. In the event that the well pump is not operating properly, either repair or replacement will be necessary.

3. Maintaining and preventing the wetland from reaching a stagnant condition will greatly decrease the probability of mosquito breeding. Therefore, to prevent stagnation from occurring, the well pump, if installed, should be manually turned on at each biannual inspection and remain on until the wetland has been completely "flushed".

4. If the wetland is "flushed" at each biannual inspection, stagnation should not become a problem. However, if at any time a "stagnate" condition occurs within the wetland, the well pump, if installed, should be manually turned on and remain on until the wetland is completely "flushed". The wetland is completely "flushed" when all evidence of stagnation has been removed and the water has returned to a "healthy" condition.

SECTION VII

OPERATIONS

VII. OPERATIONS

A. Record Keeping

The following records should be maintained:

1. Maintenance and Repair:

All instances of maintenance and repair should be logged and stored in Section IX of this manual.

- Bi-annual inspection reports: The inspection checklist should be completed at each bi-annual inspection. The completed checklist and any additional comments should be retained in Section IX of this manual. Reseeding and fertilizing shall be undertaken in October and April.
- Monthly and post-rainfall inspection and other observations: Notation should be made of monthly and post-rainfall inspections. Additionally, other instances of noteworthy observation should be recorded. All of this information should be filed in Section IX of this manual. A post-rainfall inspection is required when rainfall exceeds one-half inch (0.5") in a 24-hour period (major rainfall event). Monthly inspections will be completed on the 15th of every month.
- An annual inspection report will be performed by a registered professional engineer and shall contain all the information required by Raleigh City Code Section 10-2028. The inspection report shall be on forms supplied by the City of Raleigh. The inspection report is due on the anniversary date the as-built drawings of the stormwater wetland were first certified to the City of Raleigh. These reports should be sent to Raleigh City Public Works Department, Stormwater Division, P.O. Box 590, Raleigh, NC 27602. Any discrepancies noted in the inspections shall be corrected within thirty (30) days.

SECTION VIII

ANNUAL BUDGET AND REPLACEMENT FUND

VIII. ANNUAL BUDGET AND REPLACEMENT FUND

A. Opinion of Annual Budget

Item	Approximate Yearly Cost*
Mowing	$1,200
Seeding	$750
Fertilizer/ Lime	$150
Embankment Repair	$750
Trash Removal	$600
Sediment Removal	$2,000
Outlet Structure Maintenance (Includes Rip Rap)	$500
Rodent Control	$250
Mosquito Briquettes	$500
Professional Inspection	$1,200
Annual replacement cost (Total estimated Construction Cost/30 Years)	$4,314.14
Premiums for Liability and Casualty Insurance	$300
Total Average Yearly Maintenance Cost =	$12,514.14

**Note:*
Costs presented are approximate and are the design engineer's best estimate based on experience. The design engineer assumes no liability for the costs presented above. The costs are shown only as a general guide. Costs are shown as an average yearly value. Maintenance items such as the spillway structure and embankment may not require extensive maintenance for several years. Maintenance costs have been calculated accordingly.

B. Privately Maintained Sinking Fund Replacement Schedule

The total cost of this facility is estimated to be $170,295.00. As with the annual maintenance budget costs listed above, this cost is an estimate, and therefore, the design engineer assumes no liability with regards to this issue.

In accordance with City of Raleigh regulations, the developer will pay, at the time of either recording a subdivision plat or issuance of a building permit for a lot not established by the subdivision, whichever event occurs first, twenty-four percent (24%) of the estimated replacement cost of this facility into a general replacement fund, which is maintained by the City of Raleigh. It is advisable that the remaining seventy-six percent (76%) be collected and deposited into a privately maintained account created on behalf of the property owner's association over the useful life of the facility, which is estimated to be thirty (30) years. The Engineer's Construction Cost Opinion and an estimated schedule for the private sinking fund are attached:

One Time Payment to City of Raleigh = 0.24 * Total Estimated Construction Cost
= 0.24 * $170,295.00 = $40,870.80

McADAMS

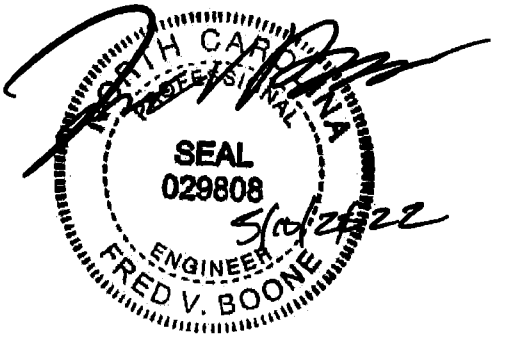
Engineer's Cost Opinion for Performance Bonding

Project Name: Hunter's Point
SCM 'A'
Project Number: LEN-20060

Date: 5/10/2022

Item No.	Description	Quantity	Unit	Unit Prices	Total
	Storm Drainage - Catch Basins (One structure up from inlet)				
1	Drop Inlet (DI-102 & 101)	2.00	Ea	$ 3,500.00	$ 7,000
2	EW-100 30" NCDOT 838.01	2.30	CY	$ 2,015.00	$ 4,635
3	Rip-Rap Dissipater (Inlet)	5.00	Ton	$ 45.00	$ 225
	Storm Drainage - Piping (One structure up from Inlet)				
1	30" RCP	344.00	LF	$ 150.00	$ 51,600
2	24" RCP	151.00	LF	$ 125.00	$ 18,875
	SCM Components				
	Grading				$ -
1	Excavation	3.00	Days	$ 4,500.00	$ 13,500
2	Rough & Fine Grade	2.00	Days	$ 5,000.00	$ 10,000
3	Convert Temporary EC Measure into Permanent SCM	2.00	Days	$ 8,600.00	$ 17,200
	Internal				
1	Specialty Riser Structure 4'x4' Internal Dimensions (ea)	1	Ea	$ 3,820.00	$ 3,820
2	Specialty Riser Trash Rack (7'x7' Outside Dimensions) (ea)	1	Ea	$ 3,000.00	$ 3,000
3	Forebay Spillway Channel Rip Rap		Ton	$ 45.00	$ -
4	Anti-Flotation Block w/Reinforced Concrete 8'x8'x1.5' (CY)	3.6	CY	$ 2,015.00	$ 7,254
5	Plug Valve & Stem Wheel (Ls)	1	Ls	$ 2,200.00	$ 2,200
6	8" DIP Drain w/Trash rack (Ls)	1	Ls	$ 750.00	$ 750
7	Concrete Collar w/# 4 rebar (ea)	1	Ea	$ 1,575.00	$ 1,575
	Riser + Outlet				
1	Concrete Cradle (cy)	19	CY	$ 350.00	$ 6,650
2	24 " O-Ring RCP Class III Pipe w/ Fabric wrapped joints (Lf)	41	Lf	$ 125.00	$ 5,125
3	4" Perforated weep drains Double-wall HDPE (ea)	2	EA	$ 75.00	$ 150
4	Outlet structure JB-300	1	EA	$ 3,500.00	$ 3,500
5	Spillwat filter 4'x9.08'x5.08' NO.67 stone (Ton)	9	TON	$ 45.00	$ 405
	Landscaping				
1	Wetland Plantings	2043.00	EA	$ 5.50	$ 11,237
2	Permanent Seeding	0.55	AC	$ 2,900.00	$ 1,595
	Total Site Direct Construction Cost				**$ 170,295**

Construction Cost = $ 170,295.00
Performance Bond = $ 212,868.75
125% of Direct Cost



REPLACEMENT FUND SCHEDULE

Total Contract Amount =	$170,295.00	
Developer Portion to City =	24%	
=	$40,870.80	
Remaining Portion to be Collected =	76%	
Remaining Contract Amount =	$129,424.20	
Facility Life Expectancy =	30	years

Year	Replacement Amount [$]
1	$4,314.14
2	$4,314.14
3	$4,314.14
4	$4,314.14
5	$4,314.14
6	$4,314.14
7	$4,314.14
8	$4,314.14
9	$4,314.14
10	$4,314.14
11	$4,314.14
12	$4,314.14
13	$4,314.14
14	$4,314.14
15	$4,314.14
16	$4,314.14
17	$4,314.14
18	$4,314.14
19	$4,314.14
20	$4,314.14
21	$4,314.14
22	$4,314.14
23	$4,314.14
24	$4,314.14
25	$4,314.14
26	$4,314.14
27	$4,314.14
28	$4,314.14
29	$4,314.14
30	$4,314.14
Total =	$129,424.20

SECTION IX

INSPECTION CHECKLIST

DAM INSPECTION CHECKLIST
HUNTER'S POINTE - SCM A, WETLAND

DATE OF INSPECTION: _____

To help the dam owner perform periodic safety inspections of the structure, a checklist is provided. Each item of the checklist should be completed. Repair is required when obvious problems are observed. Monitoring is recommended if there is potential for a problem to occur in the future. Investigation is necessary if the reason for the observed problem is not obvious.

A brief description should be made of any noted irregularities, needed maintenance, or problems. Abbreviations and short descriptions are recommended. Space at the bottom of the form should be used for any items not listed.

DAM_____	DATE_____	Y/N	MONITOR	REPAIR	INVESTIGATION
OWNER_____	WEATHER_____				
INSPECTED BY_____	POOL LEVEL_____				

Item	Comments				
1. CREST					
a. Visual settlement?					
b. Misalignment?					
c. Cracking?					
2. UPSTREAM SLOPE					
a. Erosion?					
b. Ground cover in good condition?					
c. Trees, shrubs, or other woody vegetation?					
d. Longitudinal/Vertical cracks?					
e. Adequate riprap protection?					
f. Stone deterioration?					
g. Settlements, depressions, or bulges?					
3. DOWNSTREAM SLOPE					
a. Erosion?					
b. Ground cover in good condition?					
c. Trees, shrubs, or other woody vegetation?					
d. Longitudinal/Vertical cracks?					
e. Adequate riprap protection?					
f. Settlements, depressions, or bulges?					
g. Soft spots or boggy areas?					
h. Movement at or beyond toe?					
i. Boils at toe?					
4. DRAINAGE-SEEPAGE CONTROL					
a. Seepage at toe?	Estimated _____ gpm				
b. Does seepage contain fines?					
5. ABUTMENT CONTACTS					
a. Erosion?					
b. Differential movement?					
c. Cracks?					
d. Seepage?	Estimated gpm				
e. Adequate erosion protection for ditches?					
6. INLET STRUCTURE (Riser)	Concrete Box				
a. Seepage into structure?					
b. Debris or obstructions?					
c. If concrete, do surfaces show:					
1. Spalling?(Chipping, breaking up)					
2. Cracking? (other than hairline cracks)					
3. Erosion?					
4. Scaling? (flaking off, chipping)					
5. Exposed reinforcement?					
6. Other?					
d. If metal, do surfaces show:					
1. Corrosion?					
2. Protective Coating deficient?					
3. Misalignment or split seams?					
e. Do the joints show:					
1. Displacement or offset?					
2. Loss of joint material?					
3. Leakage?					
f. Are the trash racks:					
1. Broken or bent?					
2. Corroded or rusted?					
3. Obstructed?					
4. Operational?					

INSPECTION CHECKLIST- PAGE 2 INSPECTED BY _____ DATE_____		Y/N	MONITOR	REPAIR	INVESTIGATION
7. PRINCIPAL SPILLWAY PIPE	Concrete				
a. Seepage into conduit?					
b. Debris present?					
c. Do concrete surfaces show:					
1. Spalling?					
2. Cracking?					
3. Erosion?					
4. Scaling?					
5. Exposed reinforcement?					
6. Other?					
d. Do the joints show?					
1. Displacement or offset?					
2. Loss of joint material?					
3. Leakage?					
8. EMERGENCY SPILLWAY					
a. Erosion (gullies or rills)					
b. Exposed or damaged geotextile fibers?					
9. VELOCITY DISSIPATOR	Riprap				
a. Outlet channel obstructed?					
b. Is released water:					
1. Undercutting the outlet?					
2. Eroding the embankment?					
3. Displacing riprap?					
c. Tailwater elevation and flow condition?					
10. Resevoir					
a. High water marks?					
b. Erosion/Slides into wetland area?					
c. Sediment accumulation?					
d. Floating debris present?					
e. Adequate riprap protection for ditches?					
11. INTERIOR BERM					
a. Erosion?					
b. Visual Settling?					

Reference: 2000 Maryland Stormwater Design Manual- Volume II: Stormwater Design Appendices, Maryland Department of the Environment: Water Management Administration. Note this form is adapted and modified from the original version.

Raleigh

Stormwater Device
Annual Inspection Report Checklist

Please review the following checklist prior to submitting your stormwater device annual inspection report. The checklist will help you identify items that should be included in the annual inspection report. If you are missing an item, the report may get denied. Additional information may be requested by staff. Contact us with questions at scminspections@raleighnc.gov.

Initial Below

___ a. The report is being submitted within 30 days of the date the actual inspection took place.

___ b. The report is being submitted no more than 90 days prior to the site's anniversary date.

___ c. The report is completed and sealed by a North Carolina professional engineer, surveyor, or landscape architect.

___ d. A completed Form-501 is the cover-page of the report.

- ___ Section-A clearly identifies the site name, N-file number, and site/project address.
- ___ Section-B lists the best contact information for the property owner/representative or responsible party, if different from the tax record listed property owner.
- ___ Section-C identifies each device type that was inspected (if multiple).
- ___ Section-D lists the date the actual inspection occurred within the certification statement paragraph. (The date that the report was sealed should go next the certifiers signature and/or over their seal).

___ e. All devices in the report are referenced by the name/identifier used in the original stormwater management plans for the site.

___ f. If there are multiple devices in a report, the information and photos for each device are clearly separated and labeled.

___ g. The report includes a brief summary of site/device history, and current condition (i.e. recent weather, maintenance level, minor issues, deviation from approved plans, etc..).

___ h. Any repairs made over the past year are noted in the report, with descriptions of what work was completed and when. Before and after photos are recommended but not required.

___ i. If needed routine maintenance items or repairs are noted in the report, enough detail is provided so a property owner or maintenance staff can identify and address it. (i.e. include instructions on how and when the item should be addressed)

___ j. All photos are high resolution, color images at a visible scale with captions that clearly describe what the photo is depicting.

___1. Inspection photos that must be included in report (if present in device);

___ Main Treatment Area Overview
___ Emergency Spillway
___ Forebays
___ Inlet FES & Dissipators
___ Inside & Outside Riser Structure
___ Interior of Outlet Piping
___ Device Embankments
___ Earthen Berms/Weirs
___ Interior of Inlet Piping
___ Unobstructed Orifice(s)
___ Cleanouts/Underdrains
___ Outlet FES & Dissipators

___2. Reports with underground devices must include photos taken inside the device (confined space certification may be needed). Photos that must be included in the report (if present);

___ Overview of Contributory Site
___ Unobstructed Orifice(s)
___ Interior of Detention Piping
___ Interior of Outlet Piping
___ Inlet Structures (Inside & Out)
___ Weir Walls
___ Sediment/Sand Chambers
___Outlet Discharge Area

___ k. The report is a single PDF document and submitted as an email attachment to scminspections@raleighnc.gov.

Form-501
Stormwater Device
Annual Inspection Report Summary

For City Staff Use:
Date Received:
Date Accepted:
By:
Next Report Due:

Section A - Project Information

Project Name		N-File N-
Project Address		
City	State	Zip

Section B - Property Contact Information **best contact information for responsible party*

Property Owner/Contacts Name	Email		Phone
Property Owner/Contacts Address	City	State	Zip
Recorded BK BM PG of lot for all required device(s)			

Section C – Stormwater Device Information

Additional pages are necessary to complete the stormwater device annual inspection report. The following items are to be included for each stormwater device; *initial* by each item as indication of inclusion:

____ **Narrative of general site condition**
____ **Device Type - Circle Device(s): (Wet Pond, Dry Pond, Wetland, Bioretention, UG Detention, Sand Filter, WQ Swale, Vegetative Filter Strip, Level Spreader, Permeable Pavement, Infiltration, PPUOS, Other: _____)**
____ **Disclosure of completed repairs**
____ **Site specific inspection charts/logs from the approved maintenance manual**
____ **Photographs of inspected stormwater device(s)**

____ **All items from the *Stormwater Device Annual Inspection Checklist* reviewed and addressed in report**

*Reports must be submitted in electronic form. All the above items must be included, and the report emailed to scminspections@raleighnc.gov as a **single** PDF attachment. Confirmation will be sent out within 5 days of receipt. If there is no response by the 5th day, please contact SCM Staff to make sure the report was received.

Section D - Surveyor, Engineer, or Landscape Architect Certification

I, _____, as a duly registered _____ in the State of North Carolina attest that on _____, 20____ a thorough inspection was conducted of this site to ensure all required stormwater control facilities including open space areas are performing properly and are in compliance with the approved stormwater control plan, the applicable maintenance manual required by Unified Development Ordinance (UDO) Sect 9.2.2(D) and the Raleigh Stormwater Control and Watercourse Buffer Manual. No sampling of pollutant loading is required as part of the inspection. All information provided is correct to the best of my knowledge. It is a violation of UDO 9.2.5(F) to falsify this certification. A civil penalty for falsifying this certification shall be assessed by the City of Raleigh in the amount of $3,000.00.

Certifier's Name	License Number			Place Seal Here
Title	Company Name	Email		
Address	City	State	Zip	
Signature	Date	Telephone		

Annual Inspection Reports: Per Unified Development Ordinance 9.2.2(H) an original inspection report of all required stormwater control facilities, including open space areas, shall be filed with the City; due each year on the anniversary of the as-built certification date. Annual Inspection reports shall be accompanied by City provided 'Annual Inspection Report Summary' Form-501.

PO Box 590
One Exchange Plaza
Raleigh, NC 27602
Phone (919) 996-3776
www.raleighnc.gov

SECTION X

STORMWATER WETLAND DETAILS

STORMWATER CONTROL MEASURE "A" CONSTRUCTION SPECIFICATIONS

GENERAL NOTES

1. PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE DESIGN ENGINEER'S ATTENTION IMMEDIATELY.
2. THE FINAL CERTIFICATION FOR THIS FACILITY WILL INCLUDE A CERTIFICATION BY THE ON-SITE GEOTECHNICAL ENGINEER THAT THE PROJECT WAS CONSTRUCTED PER THE APPROVED PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE ON-SITE GEOTECHNICAL ENGINEER FOR OBSERVATION AND TESTING SUCH THAT THE ON-SITE GEOTECHNICAL ENGINEER CAN CERTIFY THE CONSTRUCTION OF THE DAM EMBANKMENT AND SPILLWAY. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT AND SPILLWAY.
3. ALL CONSTRUCTION ACTIVITY RELATED TO THE PROPOSED STORMWATER CONTROL MEASURE SHALL BE PER THE DETAILS AND SPECIFICATIONS SHOWN IN THESE DRAWINGS. SOILS, COMPACTION, AND OTHER MISCELLANEOUS DETAILS AND SPECIFICATIONS MAY BE MODIFIED PER THE RECOMMENDATIONS OF THE ON-SITE GEOTECHNICAL ENGINEER. HOWEVER, PRIOR TO IMPLEMENTATION, THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DEVIATION FROM THESE DESIGN DRAWINGS, INCLUDING SHOP DRAWINGS FOR ANY PROPOSED MODIFICATION.
4. DURING THE INITIAL STAGES OF CONSTRUCTION, THE STORMWATER CONTROL MEASURE MAY BE USED AS A SEDIMENT BASIN FOR EROSION CONTROL PURPOSES. IF SO, THE CONTRACTOR SHALL FOLLOW THE GENERAL CONSTRUCTION SEQUENCE BELOW:
   A. THE CONTRACTOR SHALL CONSTRUCT THE ENTIRE FACILITY (PERMANENT OUTLET STRUCTURE, DAM, ETC.) WITH THE EXCEPTION OF THE INTERIOR FINE GRADING FOR THE FACILITY. THE INTERIOR FINE GRADING WILL BE CONSTRUCTED ONCE THE EROSION CONTROL PHASE IS COMPLETE.
   B. THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) SHALL BE CONNECTED TO THE PERMANENT 6"Ø DIP DRAIN PIPE.
   C. ONCE THE UPSTREAM DRAINAGE AREA IS STABILIZED AND THE EROSION CONTROL INSPECTOR APPROVES THE REMOVAL OF THE SEDIMENT BASIN, THE CONTRACTOR SHALL REMOVE THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) AND CLEAN OUT THE BASIN. ALL SEDIMENT, TRASH, ETC. SHALL BE DISPOSED OF PROPERLY (I.E. - PLACED IN A LANDFILL) AND NOT STOCKPILED IN AN AREA WHERE WATER QUALITY COULD BE ADVERSELY AFFECTED.
   D. ONCE THE BASIN IS CLEANED OUT, AND ALL EROSION CONTROL DEVICES REMOVED, THE CONTRACTOR SHALL CONSTRUCT THE INTERIOR GRADING SHOWN ON THIS SHEET.
   E. ONCE THE GRADING IS COMPLETE, THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO INSTALLATION OF THE STORMWATER CONTROL MEASURE PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED VEGETATION PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE.
   F. ONCE THE ENGINEER HAS APPROVED THE AS-BUILT GRADING, THE CONTRACTOR SHALL PLANT THE PROPOSED STORMWATER CONTROL MEASURE PLANTS SHOWN ON THE LANDSCAPE PLAN FOR THE FACILITY. AFTER COMPLETION OF THE PLANTING, THE LANDSCAPE CONTRACTOR SHALL PROVIDE A LETTER TO THE ENGINEER CERTIFYING THAT THE PLANTS HAVE BEEN INSTALLED PER THE APPROVED STORMWATER CONTROL MEASURE PLANTING PLAN.
5. ALL OSHA REQUIREMENTS FOR EXCAVATIONS (SHORING, DEPTH, ETC.) ARE THE RESPONSIBILITY OF THE CONTRACTOR. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE AN EXCAVATION PLAN TO BE SEALED BY A NC P.E. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE IF AN EXCAVATION PLAN IS REQUIRED. THE JOHN R. MCADAMS COMPANY ASSUMES NO RESPONSIBILITY FOR ANY EXCAVATION DESIGN RELATED TO SAFETY OR OSHA REQUIREMENTS.
6. ON-SITE GEOTECHNICAL ENGINEER TO DETERMINE IF IN-SITU SOILS ENCOUNTERED WOULD MAINTAIN A STORMWATER CONTROL MEASURE PERMANENT POOL AT DESIGN ELEVATION. IF HIGHLY PERMEABLE SOILS ARE ENCOUNTERED THAT, IN THE OPINION OF THE GEOTECHNICAL ENGINEER, WOULD NOT MAINTAIN THE PERMANENT POOL ELEVATION AS DESIGNED, A CLAY LINER MAY BE REQUIRED TO MAINTAIN A PERMANENT POOL OF WATER IN THE STORMWATER CONTROL MEASURE. DETERMINATION IF A CLAY LINER IS NEEDED SHALL BE THE RESPONSIBILITY OF THE ON-SITE GEOTECHNICAL ENGINEER. UPON DETERMINATION OF HIGHLY PERMEABLE SOIL CONDITIONS, ON-SITE GEOTECHNICAL ENGINEER WILL INFORM THE DESIGN ENGINEER. IF BLASTING IS REQUIRED DUE TO THE REMOVAL OF ROCK, A LINER SHALL BE REQUIRED.
7. IT IS ANTICIPATED THAT DEWATERING WILL BE NECESSARY IN THE EXCAVATION AREAS (E.G. - EMBANKMENT SUB GRADE, INTERIOR PORTIONS OF THE STORMWATER CONTROL MEASURE, KEY TRENCH, ETC.). THEREFORE, THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE STORMWATER CONTROL MEASURE SITE. DURING PLACEMENT OF FILL WITHIN THESE AREAS, THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION / CONSTRUCTION AREAS. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES ARE STABLE, WITH NO SEDIMENT DISCHARGED FROM THE SITE (I.E. PUMPED WATER MAY NEED TO BE DIRECTED TO AN APPROVED EROSION CONTROL DEVICE SUCH AS A DIRT BAG (ACF ENVIRONMENTAL), OR ENGINEER APPROVED EQUIVALENT, PRIOR TO DISCHARGE).
8. THE GRADES SHOWN ON THIS PLAN ARE FINISHED GRADES. IF THE EXISTING SOIL LAYER AFTER CONSTRUCTION / COMPACTION IS NOT DETERMINED SUITABLE BY A LANDSCAPE PROFESSIONAL FOR THE WETLAND PLANTINGS, THEN THE CONTRACTOR SHALL AMEND THE PLANTING AREA OF THE WETLAND AS DIRECTED BY A LANDSCAPE PROFESSIONAL.
9. PRIOR TO TOPSOIL INSTALLATION, THE CONTRACTOR SHALL SCARIFY THE TOP 2"-3" OF THE BERM SECTION TO PROMOTE BONDING OF THE TOPSOIL WITH THE COMPACTED FILL. THE TOPSOIL DEPTH SHALL RANGE FROM 3"-4" ON THE DAM EMBANKMENT AND AQUATIC SHELF. PLEASE NOTE THE TOPSOIL SHALL BE AMENDED, AS DIRECTED BY A LANDSCAPE PROFESSIONAL, PRIOR TO INSTALLATION ON THE EMBANKMENT AND AQUATIC SHELF.
10. THE CONTRACTOR SHALL REFER TO THE LANDSCAPE PLAN FOR THE PERMANENT PLANTING PLAN/SCHEDULE FOR THIS FACILITY. CONTRACTOR SHALL COORDINATE WITH A LANDSCAPE PROFESSIONAL REGARDING SCHEDULING FOR PLANT INSTALLATION. PLEASE NOTE THAT NO TREES/SHRUBS OF ANY TYPE MAY BE PLANTED ON THE PROPOSED DAM EMBANKMENT (FILL AREAS).

OUTLET STRUCTURE MATERIAL SPECIFICATIONS

1. THE 24"Ø RCP OUTLET BARREL SHALL BE CLASS III RCP, MODIFIED BELL AND SPIGOT, MEETING THE REQUIREMENTS OF ASTM C76-LATEST. THE PIPES SHALL HAVE CONFINED O-RING RUBBER GASKET JOINTS MEETING ASTM C443-LATEST. THE PIPE JOINTS SHALL BE TYPE R-4.
2. THE STRUCTURAL DESIGN FOR THE 4' X 4' (INTERNAL DIMENSIONS) RISER BOX WITH EXTENDED BASE SHALL BE BY OTHERS. PRIOR TO ORDERING THE STRUCTURES, THE CONTRACTOR SHALL PROVIDE, TO THE DESIGN ENGINEER FOR REVIEW, SHOP DRAWINGS AND SUPPORTING STRUCTURAL CALCULATIONS SEALED BY A P.E. REGISTERED IN NORTH CAROLINA DEMONSTRATING THE PERTINENT VERTICAL LOADS ARE SUPPORTED BY THE CONCRETE RISER STRUCTURE.
3. THE RISER BOX OUTLET STRUCTURE SHALL BE PROVIDED WITH STEPS 16" ON CENTER. STEPS SHALL BE PROVIDED ON THE INNER WALL OF THE RISER BOX. STEPS SHALL BE IN ACCORDANCE WITH NCDOT STD. 840.66. PLEASE REFER TO SHEET C9.A2 FOR LOCATION OF THE RISER STEPS. NOTE THE STEPS SHALL LINE UP WITH THE ACCESS HATCH OF THE TRASH RACK.
4. THE CONCRETE ANTI-FLOTATION BLOCK SHALL BE CAST-IN-PLACE. STEEL REINFORCEMENT AND CONNECTION TO THE RISER SHALL BE PROVIDED IN ACCORDANCE WITH THE DETAIL ON SHEET C9.A4. THE CONTRACTOR SHALL ENSURE THE WEIGHT OF THE ENTIRE RISER STRUCTURE IS GREATER THAN OR EQUAL TO 25,187 LBS. IN LIEU OF CAST-IN-PLACE, THE CONTRACTOR MAY OPT FOR A PRECAST ANTI-FLOTATION BLOCK. SHOP DRAWINGS FOR THE PRECAST BLOCK SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE PRECAST ANTI-FLOTATION BLOCK SHALL HAVE A SHIPPING WEIGHT OF 37,233 LBS.
5. THE RISER BOX JOINTS SHALL BE SEALED USING BUTYL RUBBER SEALANT CONFORMING TO ASTM-C990-LATEST. IF NECESSARY, THE CONTRACTOR SHALL INCORPORATE A WATERSTOP INTO THE RISER BOX JOINT TO ENSURE A WATERTIGHT CONNECTION. THE CONTRACTOR SHALL PARGE JOINTS ON BOTH THE INSIDE AND OUTSIDE WITH NON-SHRINK GROUT AND INSTALL GALVANIZED STEEL STRAPS PER DETAIL ON SHEET C9.A2.
6. PRIOR TO ORDERING, THE CONTRACTOR SHALL SUBMIT TRASH RACK SHOP DRAWINGS TO THE ENGINEER FOR REVIEW. CONTRACTOR SHALL ENSURE THAT AN ACCESS HATCH IS PROVIDED WITHIN THE TRASH RACK (SEE DETAIL FOR LOCATION) THAT WILL ALLOW FOR FUTURE MAINTENANCE ACCESS. CONTRACTOR SHALL ALSO PROVIDE A CHAIN AND LOCK FOR SECURING THE ACCESS HATCH. NOTE THE ACCESS HATCH SHALL LINE UP WITH THE ACCESS STEPS AFTER INSTALLATION.
7. ALL POURED CONCRETE SHALL MEET THE FOLLOWING SPECIFICATIONS UNLESS OTHERWISE NOTED:
   -MINIMUM 3000 PSI (28 DAY)
   -SLUMP = 3" - 5"
   -ENTRAINED AIR = 5% - 7%

   PLEASE NOTE NO CONCRETE SHALL BE POURED WHEN THE AMBIENT AIR TEMPERATURES ARE EXPECTED TO BE ABOVE 85°F OR BELOW 40°F. CAST-IN-PLACE CONCRETE SHALL BE "WET CURED" AFTER FINISHING FOR A MINIMUM OF 48 HOURS.

   ON-SITE GEOTECHNICAL ENGINEER TO ENSURE AND CERTIFY ALL POURED CONCRETE MEETS THE ABOVE SPECIFICATIONS.
8. GEOTEXTILE FABRIC FOR THE 24"Ø RCP OUTLET BARREL JOINTS SHALL BE MIRAFI 180N OR ENGINEER APPROVED EQUAL (NON-WOVEN FABRIC)
9. STORMWATER CONTROL MEASURE EMERGENCY DRAW DOWN IS VIA AN 6"Ø PLUG VALVE. THE VALVE SHALL BE A M&H STYLE 1820 ECCENTRIC VALVE OR APPROVED EQUAL. THIS VALVE IS IN ACCORDANCE WITH AWWA C-517, AND SHALL BE OPERABLE FROM TOP OF OUTLET STRUCTURE VIA A HAND WHEEL (SEE DETAIL SHEET C9.A2). THE CONTRACTOR SHALL PROVIDE A REMOVABLE VALVE WRENCH WITH A HAND WHEEL ON TOP FOR OPERATION OF THE 6"Ø PLUG VALVE.

STATEMENT OF RESPONSIBILITY

1. ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THE STORMWATER CONTROL MEASURE SHALL BE THE RESPONSIBILITY OF THE OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.

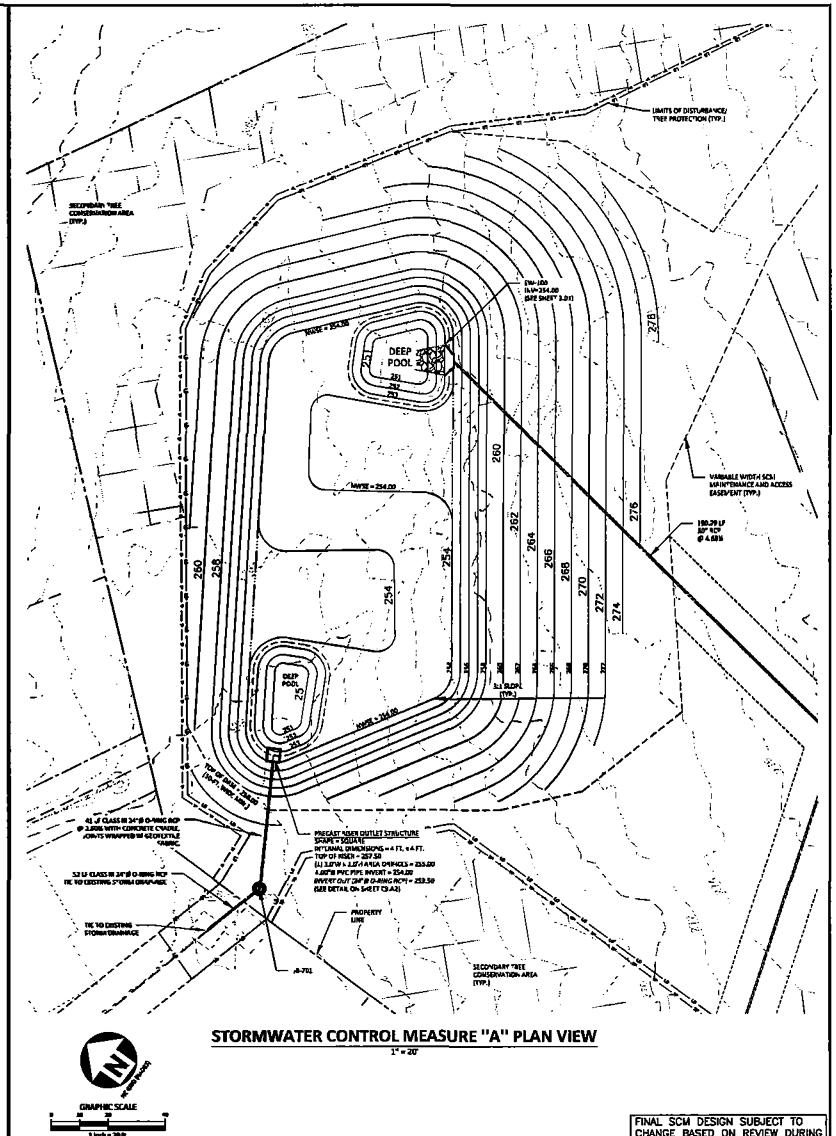
THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.

CONSTRUCTION SEQUENCE

1. PRIOR TO CONSTRUCTION, THE OWNER SHALL OBTAIN A LAND DISTURBING (GRADING) PERMIT AND AN "APPROVAL TO CONSTRUCT" FROM THE CITY OF RALEIGH AND ALL OTHER NECESSARY PERMITS FROM APPLICABLE AGENCIES (E.G. 404 / 401 PERMITS).
2. INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES PER THE APPROVED SEDIMENT AND EROSION CONTROL PLAN. THE CONTRACTOR SHALL MAINTAIN ALL APPROVED SEDIMENT AND EROSION CONTROL MEASURES THROUGHOUT THE ENTIRE PROJECT, AS REQUIRED. THE CONTRACTOR SHALL RECEIVE APPROVAL FROM THE EROSION CONTROL INSPECTOR, AS REQUIRED BY GOVERNING AGENCIES, PRIOR TO ANY CLEARING.
3. CLEAR AND GRUB AREA WITHIN THE LIMITS OF THE PROPOSED DAM CONSTRUCTION. ALL TREES AND THEIR ENTIRE ROOT SYSTEMS MUST BE REMOVED FROM THE DAM FOOTPRINT AREA AND BACKFILLED WITH SUITABLE SOIL MATERIAL. THE BACKFILLED AREAS SHALL BE COMPACTED TO THE SAME STANDARDS AS THE DAM EMBANKMENT. THE REMAINING AREA OF THE EMBANKMENT SHALL BE STRIPPED TO A SUITABLE DEPTH AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER. ANY RESIDUAL SOILS TO BE LEFT IN PLACE MUST BE WELL SCARIFIED TO PROMOTE BONDING OF THE NEW EMBANKMENT FILL. NO EMBANKMENT MATERIAL SHALL BE PLACED FOR THE DAM OR KEY TRENCH UNTIL APPROVAL OF THE DAM SUBGRADE IS OBTAINED FROM THE ON-SITE GEOTECHNICAL ENGINEER.
4. EXCAVATE FOR THE NEW KEY TRENCH ALONG THE CENTERLINE OF THE PROPOSED DAM EMBANKMENT. THE TRENCH SHALL EXTEND A MINIMUM OF 3 FT BELOW EXISTING GRADE OR 2 FT BELOW THE 24"Ø RCP OUTLET BARREL AND SHALL HAVE A MINIMUM BOTTOM WIDTH OF 5 FEET. THE KEY TRENCH SIDESLOPES SHALL BE A MINIMUM OF 1:1 (H:V). WHEN EXCAVATING THE KEY TRENCH, IF ANY DEBRIS IS ENCOUNTERED TO AN EXTENT THAT SUCH DEBRIS MAY EXIST IN OTHER INSITU PORTIONS OF THE DAM EMBANKMENT, IT SHOULD ALSO BE REMOVED. THE KEY TRENCH SHALL BE COMPACTED TO THE SAME SPECIFICATION LISTED IN ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." DEPENDING UPON ON-SITE SOIL CONDITIONS ENCOUNTERED DURING EXCAVATION, THE ON-SITE GEOTECHNICAL ENGINEER MAY VARY THE DEPTH AND DIMENSIONS OF THE KEY TRENCH AS DEEMED NECESSARY. THE ON-SITE GEOTECHNICAL ENGINEER SHALL RETAIN DOCUMENTATION OF ANY VARIATION FOR FUTURE AS-BUILT SUBMITTALS TO THE CITY OF RALEIGH.
5. BEGIN PLACEMENT OF BACKFILL WITHIN THE KEY TRENCH. THE KEY TRENCH SHALL BE COMPACTED TO THE SPECIFICATIONS LISTED ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." THE KEY TRENCH SHALL BE TESTED PER THE SPECIFICATIONS LISTED IN THAT SECTION.
6. PRIOR TO INSTALLATION, SUBGRADE CONDITIONS ALONG THE SPILLWAY PIPES SHOULD BE EVALUATED BY THE ON-SITE GEOTECHNICAL ENGINEER TO ASSESS WHETHER SUITABLE BEARING CONDITIONS EXIST AT THE SUBGRADE LEVEL. SHOULD SOFT OR OTHERWISE UNSUITABLE CONDITIONS BE ENCOUNTERED ALONG THE PIPE ALIGNMENTS, THESE MATERIALS SHOULD BE UNDERCUT AS DIRECTED BY THE GEOTECHNICAL ENGINEER. THE UNDERCUT MATERIALS SHALL BE REPLACED WITH ADEQUATELY COMPACTED STRUCTURAL FILL, LEAN CONCRETE OR FLOWABLE FILL, AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.
7. IN ORDER TO HELP PROTECT THE SOIL SUBGRADE FROM DETERIORATION (DUE TO EXPOSURE, RAINFALL, SEEPAGE, AND RUNOFF) BEFORE THE CRADLE CAN BE POURED, IT IS STRONGLY RECOMMENDED THAT A 3" TO 4" THICK CONCRETE MUD MAT BE POURED OVER THE SUBGRADE ONCE IT IS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE MUD MAT WILL ALSO PROVIDE BEARING FOR THE BLOCKS THAT TEMPORARILY SUPPORT THE SPILLWAY PIPE UNTIL THE CRADLE CAN BE POURED. THE METHOD OF BLOCK SUPPORT FOR THE PIPE PROPOSED BY THE CONTRACTOR SHOULD BE SUBMITTED TO THE JOHN R. McADAMS COMPANY FOR REVIEW
8. BEGIN CONSTRUCTION OF THE NEW EMBANKMENT. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8" THICK LIFTS PRIOR TO COMPACTION, UNLESS DIRECTED OTHERWISE BY THE ON-SITE GEOTECHNICAL ENGINEER. FILL LIFTS SHALL BE CONTINUOUS OVER THE ENTIRE LENGTH OF FILL. IF IT IS NECESSARY, THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO FINAL GRADE IN ORDER TO ACHIEVE PROPER COMPACTION.
9. AS CONSTRUCTION OF THE EMBANKMENT MOVES FORWARD, IT WILL BE NECESSARY TO INSTALL THE CONCRETE CRADLE. SEE NOTE ON CRADLE DETAIL (SHEET C9.A4). THIS MAY BE CONSTRUCTED USING ONE OF THE FOLLOWING METHODS:
   A. IF THE PROPOSED STRUCTURAL FILL MATERIAL IS UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADLE, THEN THE STRUCTURAL FILL SHOULD BE INSTALLED AND COMPACTED UP TO THE TOP OF CONCRETE CRADLE ELEVATION. ONCE THE STRUCTURAL FILL REACHES THE NEXT DOWNSTREAM JUNCTION BOX OR HEADWALL AND IS COMPACTED TO THE ELEVATION OF THE TOP OF THE CONCRETE CRADLE, EXCAVATE THE CONCRETE CRADLE TRENCH PER THE PROVIDED DETAILS AND CONSTRUCT THE CONCRETE CRADLE AS PER THE PROVIDED CONCRETE CRADLE DETAIL.
   B. IF THE PROPOSED STRUCTURAL FILL IS NOT UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADLE, THEN PRIOR TO CONSTRUCTING THE STRUCTURAL FILL EMBANKMENT, THE FORMWORK FOR THE CONCRETE CRADLE SHOULD BE INSTALLED ON EXISTING GROUND AND/OR THE MUD MAT. THE CONCRETE CRADLE SHALL BE CONSTRUCTED PER THE PROVIDED DETAILS
10. AS AN ALTERNATE TO A CONCRETE CRADLE UNDER THE BARREL PIPE (SEE SHEET C9.A4), THE CONTRACTOR MAY CHOOSE TO ELIMINATE THE CONCRETE CRADLE AND USE COMPACTED BACKFILL IF THE ON-SITE GEOTECHNICAL ENGINEER WILL PROVIDE A NC PE SEALED LETTER CERTIFYING THAT THE COMPACTION UNDER, AROUND, AND ABOVE THE BARREL MEETS THE SPECIFICATIONS OF THE EMBANKMENT COMPACTION REQUIREMENTS AND MOISTURE CONTENT. THIS CERTIFICATION LETTER MUST BE SUBMITTED TO THE DESIGN ENGINEER PRIOR TO BACKFILL. THIS SEPARATE CERTIFICATION MUST BE SPECIFIC TO THE BARREL PIPE FOR THE FACILITY, AND MUST CLEARLY STATE THAT ALL SOIL MATERIAL UNDER, AROUND, AND ABOVE THE BARREL PIPE MEETS THE BERM AND SOIL COMPACTION SPECIFICATIONS ON THIS SHEET. THIS CERTIFICATION IS TO INCLUDE REFERENCE TO BOTH MATERIAL AND COMPACTION, AND MUST STATE THAT ALL MATERIALS UNDER, AROUND, AND ABOVE THE BARREL HAVE BEEN COMPACTED PER THE BERM MATERIAL SPECIFICATIONS (AT LEAST 95% OF MAXIMUM DRY DENSITY USING ASTM D698 STANDARD PROCTOR) WITH NO VOID SPACES PRESENT. THE CONTRACTORS INTENT TO UTILIZE THIS ALTERNATIVE MUST BE STATED PRIOR TO CONSTRUCTION TAKING PLACE. THIS CONTRACTORS CERTIFICATION MUST BE PRESENTED TO THE DESIGN ENGINEER BEFORE AN AS-BUILT CERTIFICATION CAN BE ISSUED FOR THIS FACILITY.
11. INSTALL RISER / BARREL ASSEMBLY, ALONG WITH THE EMERGENCY DRAIN SYSTEM. INSTALL 24" RCP OUTLET BARREL SPILLWAY FILTER FROM THE DETAILS SHOWN ON SHEET C9.A3.
12. CONSTRUCT EMBANKMENT PER SPECIFICATIONS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS" AND REQUIREMENTS OF THE ON-SITE GEOTECHNICAL ENGINEER. ALL CHARACTERISTICS OF THE EMBANKMENT FILL MATERIAL SHALL MEET THE STANDARDS SET FORTH IN "BERM AND SOIL COMPACTION SPECIFICATIONS", INCLUDING COMPACTION AND MOISTURE REQUIREMENTS. IF NECESSARY TO ACHIEVE PROPER COMPACTION, THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO PROPER FINAL GRADE. ANY HAND COMPACTION ACTIVITIES AROUND SPILLWAY OR DRAIN STRUCTURES SHALL BE CONDUCTED IN 4-INCH LOOSE LIFTS AND BE TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT. ALL COMPACTION AND MOISTURE TESTING SHALL BE CARRIED OUT AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER AND AS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS".
13. UPON COMPLETION OF DAM EMBANKMENT, PROMPTLY STABILIZE AND SEED DAM EMBANKMENT PER SEEDING SCHEDULE. PERMANENT GROUND COVER SHALL BE ESTABLISHED PER THE PERMANENT SEEDING SCHEDULE FOUND ON SHEET C9.A4.
14. SCHEDULE A FINAL AS-BUILT INSPECTION AND AS-BUILT SURVEY WITH THE ENGINEER. AN AS-BUILT INSPECTION SHOULD BE SCHEDULED A MINIMUM OF 60 DAYS BEFORE A PERMIT TO IMPOUND IS REQUIRED. ANY COMMENTS OR DEFICIENCIES IN THE DAM CONSTRUCTION MUST BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AND OWNER BEFORE CERTIFICATION SHALL BE GRANTED.

BERM AND SOIL COMPACTION SPECIFICATIONS

1. PRIOR TO CONSTRUCTION, THE ON-SITE GEOTECHNICAL ENGINEER SHALL IDENTIFY BORROW / FILL AREAS AND VERIFY THEIR SUITABILITY FOR USE WITHIN THE DAM EMBANKMENT. ALSO, THE ON-SITE GEOTECHNICAL ENGINEER SHALL PERFORM STANDARD PROCTORS ON THE PROPOSED BORROW MATERIAL TO ENSURE THAT OPTIMUM MOISTURE CONTENT AND COMPACTION CAN BE ACHIEVED / CONTROLLED DURING CONSTRUCTION.
2. ALL FILL MATERIALS TO BE USED FOR THE DAM EMBANKMENT SHALL BE TAKEN FROM BORROW AREAS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE FILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS, WOOD, STONES GREATER THAN 6", AND FROZEN OR OTHER OBJECTIONABLE MATERIAL. THE FOLLOWING SOIL TYPES ARE SUITABLE FOR USE AS FILL WITHIN THE DAM EMBANKMENT AND KEY TRENCH: ML AND CL. ALL FILL MATERIALS SHALL BE APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER FOR THE INTENDED USE.
3. FILL PLACEMENT FOR THE EMBANKMENT SHALL NOT EXCEED A MAXIMUM 8" LIFT (UNCOMPACTED). EACH LIFT SHALL BE CONTINUOUS FOR THE ENTIRE LENGTH OF EMBANKMENT. BEFORE PLACEMENT OF FILL FOR THE BERM SECTION, ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND THE SURFACE PROPERLY PREPARED FOR FILL PLACEMENT. FILL MATERIAL ADJACENT TO ALL SPILLWAY AND DRAINAGE STRUCTURES SHALL BE PLACED IN 4-INCH (UNCOMPACTED) LIFTS AND HAND-COMPACTED TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT.
4. ALL FILL SOILS USED IN THE EMBANKMENT CONSTRUCTION SHALL BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN -1 TO +3 PERCENT OF ITS OPTIMUM MOISTURE CONTENT. COMPACTION TESTS SHALL BE PERFORMED BY THE ON-SITE GEOTECHNICAL ENGINEER DURING CONSTRUCTION TO VERIFY THAT THE PROPER COMPACTION LEVEL HAS BEEN REACHED. THE FILL SHOULD BE COMPACTED USING A SHEEPSFOOT TYPE COMPACTOR. IN ORDER TO PREVENT DAMAGE TO THE PIPE, NO COMPACTION EQUIPMENT SHALL CROSS ANY PIPE UNTIL MINIMUM COVER IS ESTABLISHED ALONG THE PIPE.
5. THE DESIGN ENGINEER SHALL BE PROVIDED WITH REPORTS AND CERTIFICATION, BY THE ON-SITE GEOTECHNICAL ENGINEER, THAT THE GEOTECHNICAL ASPECTS OF THE FACILITY HAVE BEEN CONSTRUCTED PER PLAN. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT AND SPILLWAY. THESE REPORTS AND CERTIFICATION WILL BE NEEDED DURING THE AS-BUILT CERTIFICATION PROCESS FOR THIS STORMWATER CONTROL MEASURE. THEREFORE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE TESTING AND OBSERVATION WITH THE ON-SITE GEOTECHNICAL ENGINEER.
6. TESTING OF THE NEW FILL MATERIALS SHALL BE PERFORMED TO VERIFY THAT THE RECOMMENDED LEVEL OF COMPACTION IS ACHIEVED DURING CONSTRUCTION. THEREFORE, ONE DENSITY TEST SHALL BE PERFORMED FOR EVERY 2,500 SQUARE FEET OF AREA FOR EVERY LIFT OF FILL OR AS RECOMMENDED BY THE ON-SITE GEOTECHNICAL ENGINEER.
7. TESTING WILL BE REQUIRED ALONG THE 24"Ø RCP OUTLET BARREL AT A FREQUENCY OF ONE TEST PER 25 LF OF PIPE PER VERTICAL FOOT OF FILL OR AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.



STORMWATER CONTROL MEASURE "A" PLAN VIEW
1" = 20'

FINAL SCM DESIGN SUBJECT TO CHANGE BASED ON REVIEW DURING FINAL DEVELOPMENT OF EACH LOT.

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

City of Raleigh Development Approval

City of Raleigh Review Officer

FINAL DRAWING - RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT
LENNAR
1100 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

NORTH CAROLINA PROFESSIONAL ENGINEER 35928 RYAN C. AKERS

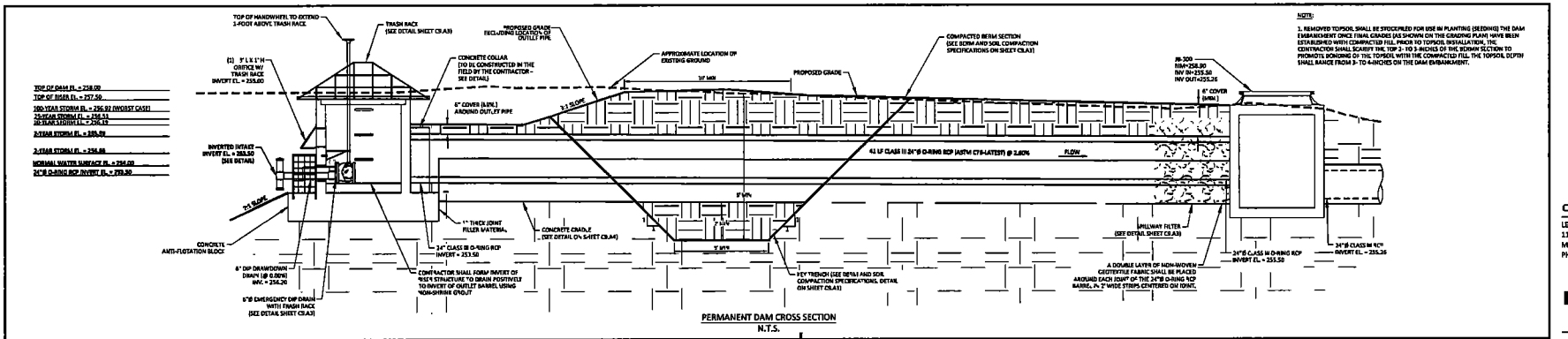
REVISIONS
NO. DATE

PLAN INFORMATION

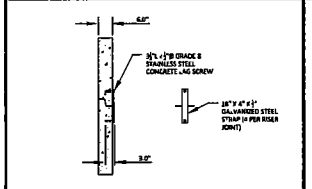
PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWA
CHECKED BY	RCA
DRAWN BY	MJP
SCALE	1" = 20'
DATE	01. 05. 2022
SHEET	

STORMWATER CONTROL MEASURE "A" PLAN VIEW

C9.A1

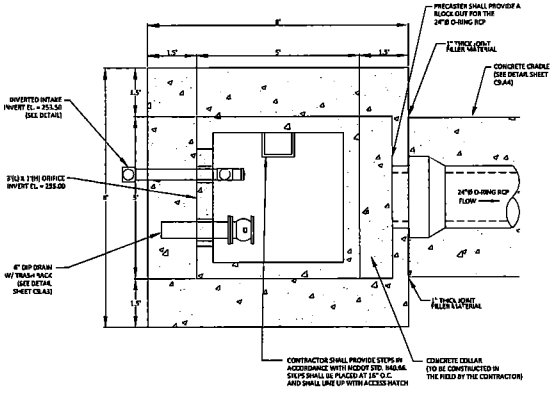


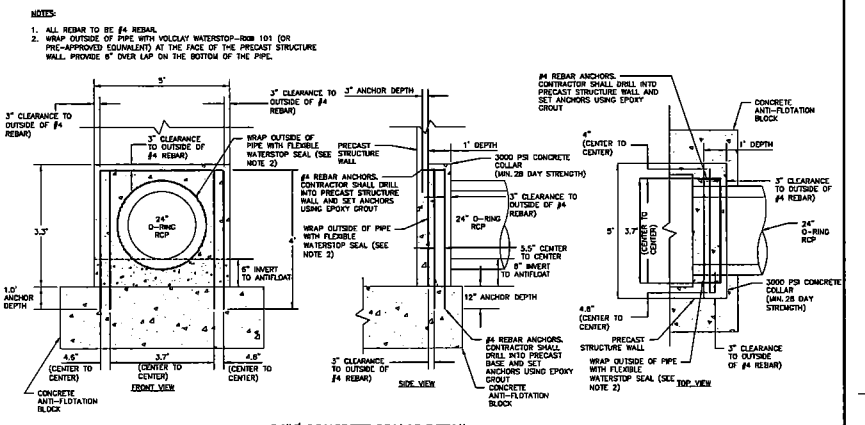
PERMANENT DAM CROSS SECTION
N.T.S.



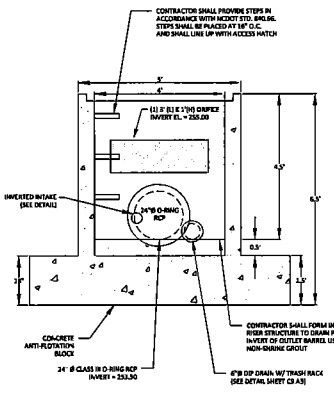
RISER JOINT CONNECTION DETAIL
N.T.S.

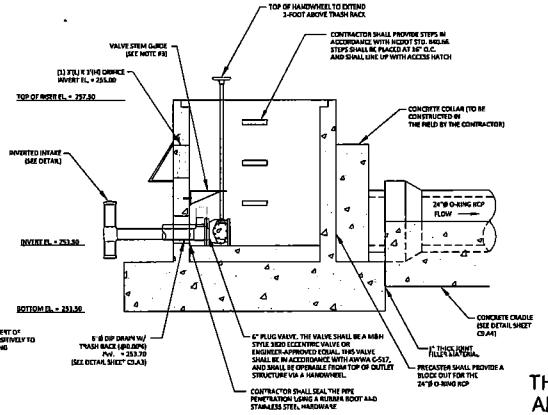
NOTES:
1. CONCRETE ANTI-FLOTATION BLOCK TO BE PROVIDED WITH MINIMUM TEMPERATURE AND SHRINKAGE STEEL REINFORCEMENT.
2. TRASH RACES NOT SHOWN FOR CLARITY.
3. THE NUMBER OF GUIDES FOR THE VALVE STEM SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR. THE VALVE STEM MUST BE OPERABLE FROM THE TOP OF THE RISER VIA THE HANDWHEEL WITH AN DESIGN POINT AMOUNT OF PLAY IN THE VALVE STEM.
4. CONTRACTOR SHALL PROVIDE A JOINT IN THE OUTLET BARREL NO MORE THAN 5-FT FROM THIS RISER.



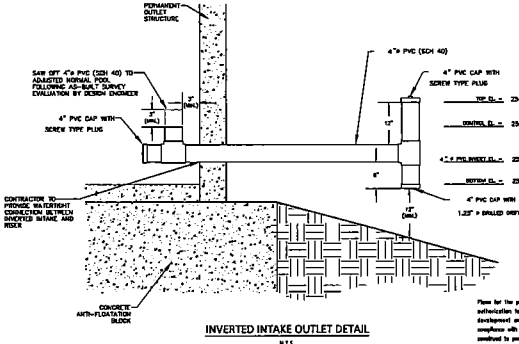


24"Ø CONCRETE COLLAR DETAIL
N.T.S.





PERMANENT OUTLET STRUCTURE DETAILS
N.T.S.



INVERTED INTAKE OUTLET DETAIL
N.T.S.

FINAL SCM DESIGN SUBJECT TO CHANGE BASED ON REVIEW DURING FINAL DEVELOPMENT OF EACH LOT.

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be considered to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval. This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approved error issued will invalidate this approval.

City of Raleigh Development Approval

City of Raleigh Review Officer

FINAL DRAWING - RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT
LENNAR
1100 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

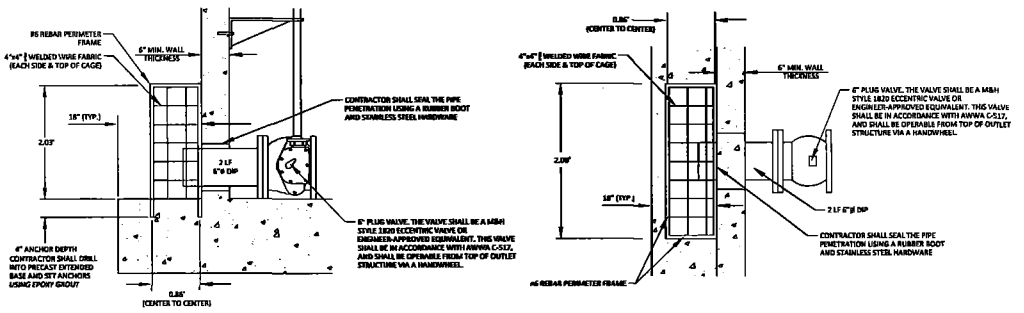
REVISIONS
NO. DATE

PLAN INFORMATION
PROJECT NO. LEN-20060
FILENAME LEN20060-SWA
CHECKED BY RCA
DRAWN BY MJP
SCALE NTS
DATE 01. 05. 2022
SHEET

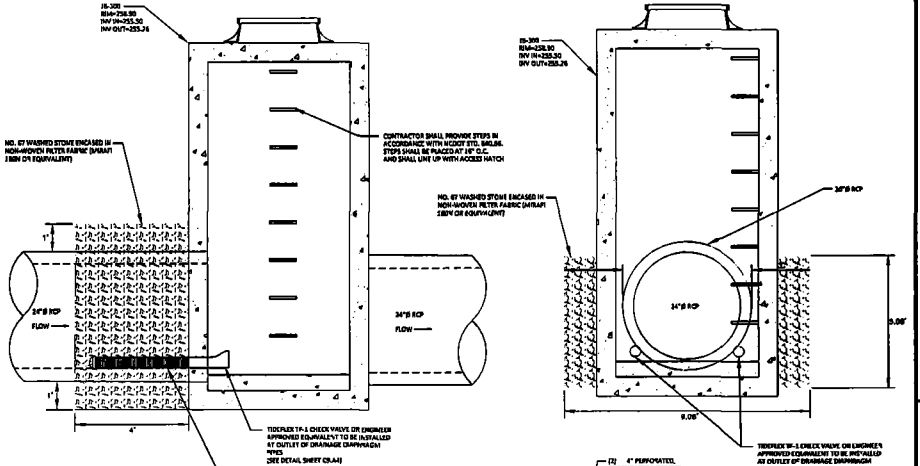
STORMWATER CONTROL MEASURE "A" DETAILS

C9.A2

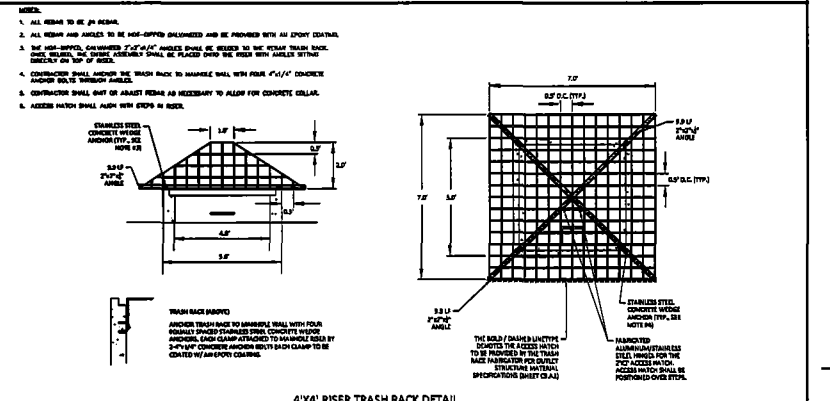
THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.



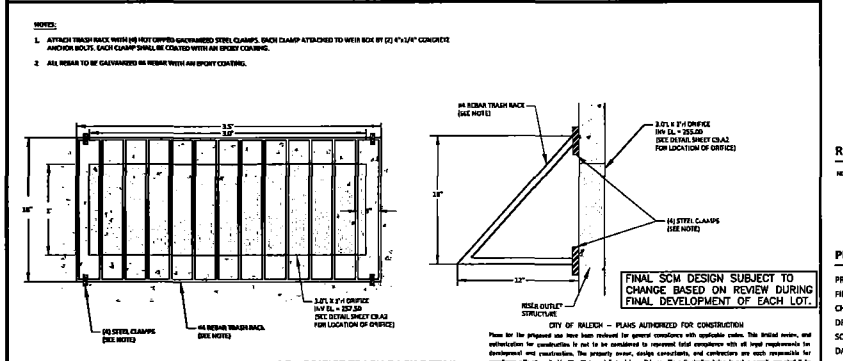
6"Ø EMERGENCY DIP DRAIN TRASH RACK DETAILS
N.T.S.



SPILLWAY FILTER DETAIL
N.T.S.



4'X4' RISER TRASH RACK DETAIL
N.T.S.



AREA ORIFICE TRASH RACK DETAIL
N.T.S.

FINAL SCM DESIGN SUBJECT TO CHANGE BASED ON REVIEW DURING FINAL DEVELOPMENT OF EACH LOT.

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approved areas issued will invalidate this approval.

City of Raleigh Development Approval _____
City of Raleigh Review Officer

FINAL DRAWING - RELEASED FOR CONSTRUCTION

McAdams
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT

LENNAR
1300 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29625 JOHN C. ACKIS

REVISIONS

NO.	DATE

PLAN INFORMATION

PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWA
CHECKED BY	RCA
DRAWN BY	MJP
SCALE	NTS
DATE	01. 05. 2022

SHEET

STORMWATER CONTROL MEASURE "A" DETAILS

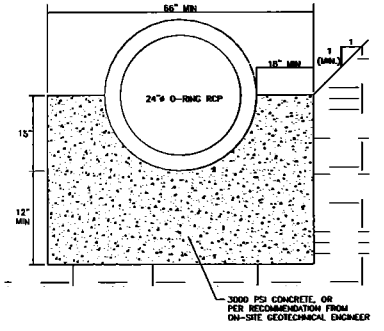
C9.A3

NOTE:

1. AS AN ALTERNATE TO A CONCRETE CRADLE UNDER THE BARREL PIPE (THIS DETAIL), THE CONTRACTOR MAY CHOOSE TO ELIMINATE THE CONCRETE CRADLE AND USE COMPACTED BACKFILL IF THE ON-SITE GEOTECHNICAL ENGINEER WILL PROVIDE A NCPE SEALED LETTER CERTIFYING THAT THE COMPACTION UNDER, AROUND, AND ABOVE THE BARREL MEETS THE SPECIFICATIONS OF THE EMBANKMENT COMPACTION REQUIREMENTS AND MOISTURE CONTENT. THIS CERTIFICATION LETTER MUST BE SUBMITTED TO THE DESIGN ENGINEER BEFORE AS-BUILT CERTIFICATION OF THE FACILITY. THIS SEPARATE CERTIFICATION MUST BE SPECIFIC TO THE BARREL PIPE FOR THE FACILITY, AND MUST CLEARLY STATE THAT ALL SOIL MATERIAL UNDER, AROUND, AND ABOVE THE BARREL PIPE MEETS THE BERM MATERIAL SPECIFICATIONS. THIS CERTIFICATION IS TO INCLUDE REFERENCE TO BOTH MATERIAL AND COMPACTION, AND MUST STATE THAT ALL MATERIALS UNDER, AROUND, AND ABOVE THE BARREL HAVE BEEN COMPACTED PER THE BERM MATERIAL SPECIFICATIONS (AT LEAST 95% OF MAXIMUM DRY DENSITY USING ASTM D698 STANDARD PROCTOR) WITH NO VOID SPACES PRESENT. THE CONTRACTOR INTENT TO UTILIZE THIS ALTERNATIVE MUST BE STATED PRIOR TO CONSTRUCTION TAKING PLACE. THIS CONTRACTORS CERTIFICATION MUST BE PRESENTED TO THE DESIGN ENGINEER BEFORE AN AS-BUILT CERTIFICATION CAN BE ISSUED FOR THIS FACILITY.
2. CONTRACTOR SHALL PROVIDE A JOINT IN THE OUTLET BARREL NO MORE THAN 5-FT FROM THE RISER.

BARREL PIPE CONCRETE CRADLE CONSTRUCTION SEQUENCE

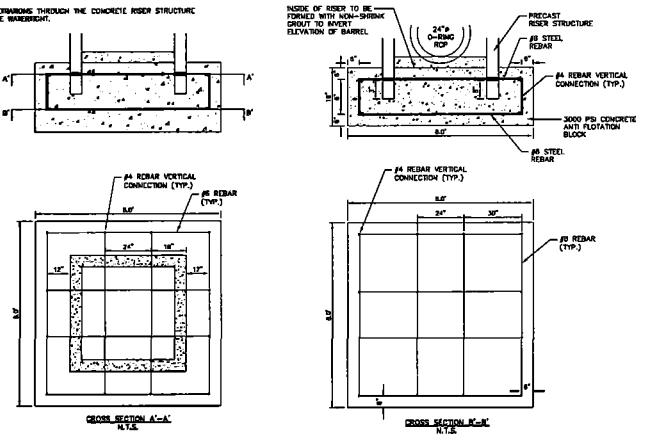
1. IF OPTION A IS CHOSEN FROM NOTE 9 OF THE OUTLET STRUCTURE MATERIAL SPECIFICATIONS (SHEET C8A.1), THEN BRING GRADE OF DAM EMBANKMENT TO SPRINGLINE OF PIPE ELEVATION. IF OPTION B IS CHOSEN FROM NOTE 9 OF THE OUTLET STRUCTURE MATERIAL SPECIFICATIONS, THEN CONSTRUCT FORMWORK FOR CONCRETE CRADLE ON EXISTING GRADE.
2. IF OPTION A IS CHOSEN FROM NOTE 9 OF THE OUTLET STRUCTURE MATERIAL SPECIFICATIONS, THEN EXCAVATE TRENCH FOR CRADLE AND BARREL PER DIMENSIONS ON DRAWINGS. IF OPTION B IS CHOSEN FROM NOTE 9 OF THE OUTLET STRUCTURE MATERIAL SPECIFICATIONS, PROCEED TO STEP 3 BELOW.
3. PLACE BARREL PIPE ON CONCRETE BLOCKS TO GRADE. AT THIS STEP, CONTRACTOR SHALL WRAP A DOUBLE LAYER OF NON-WOVEN GEOTEXTILE FABRIC AROUND EACH JOINT OF THE 24"Ø O-RING RCP BARREL IN 2' WIDE STRIPS CENTERED ON JOINT.
4. PLACE CONCRETE FOR CRADLE FOR EACH SECTION FROM ONE SIDE OF THE TRENCH. ALLOW CONCRETE TO FILL ENTIRE AREA UNDER PIPE AND PIPE HAUNCHES AS TO LEAVE NO VOIDS UNDER THE PIPE BEFORE PLACING CONCRETE ON THE OPPOSITE SIDE OF THE TRENCH. PLACE ENTIRE CRADLE AS ONE LIFT (VERTICALLY) PER DRAWINGS.
5. CONCRETE CRADLE MAY BE ELIMINATED PER RECOMMENDATION FROM THE ON-SITE GEOTECHNICAL ENGINEER. ANY DEVIATION FROM THIS DETAIL SHALL BE SUBMITTED TO AND REVIEWED BY THE DESIGN ENGINEER PRIOR TO IMPLEMENTATION. IF THE CRADLE IS ELIMINATED, THEN A LETTER FROM AN NC PE CERTIFYING THAT ALL SOIL MATERIAL UNDER, AROUND, AND ABOVE THE BARREL PIPE MEETS THE BERM MATERIAL SPECIFICATIONS IS REQUIRED.
6. ALLOW CRADLE TO CURE FOR A MINIMUM OF 7 DAYS BEFORE ANY VIBRATING COMPACTION EQUIPMENT IS USED IN THE VICINITY OF THE BARREL PIPE.
7. TRENCH TO BE BACKFILLED IN 5" LIFTS WHEN COMPACTION IS BY HAND. BACKFILL IS IN 8" LIFTS WHEN CONDUCTED BY MACHINE. MINIMUM OF 2 FEET COVER MUST BE PRESENT ON 24"Ø RCP BEFORE DRIVING OVER WITH HEAVY EQUIPMENT.



24" CONCRETE CRADLE DETAIL
N.T.S.

NOTES:

1. ALL REINFORCING STEEL IN RISER ANTI-FLOTATION BLOCK TO BE GRADE 60 #6 BARS FOR HORIZONTAL CROSSING AND GRADE 60 #4 BARS FOR VERTICAL CONNECTIONS.
2. INSIDE OF RISER BOTTOM TO BE FORMED WITH NON-SHRINK GROUT TO INVERT ELEVATION OF BARREL.
3. ALL PIPE PENETRATIONS THROUGH THE CONCRETE RISER STRUCTURE SHALL BE MADE WATERTIGHT.



RISER/ANTI-FLOTATION BLOCK CONNECTION
N.T.S.

SEEDBED PREPARATION

1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3-4 INCHES DEEP OVER ADVERSE SOIL CONDITIONS. TOPSOIL SHOULD BE INCORPORATED INTO THE FINAL GRADING OF THE BASIN SIDE SLOPES AND AQUATIC SHELF. CONTRACTOR SHOULD SCARIFY THE TOP 3-4 INCHES OF THE COMPACTED FILL TO PROMOTE BONDING WITH TOPSOIL.
2. RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. PER ONE TIME ONLY, APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL.
5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM REASONABLY UNIFORM SECONDED IS PREPARED 4 TO 6 INCHES DEEP.
6. SEED ON A FRESHLY PREPARED SEEDBED AND COVER.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. AFTER PERMANENT COVER IS ESTABLISHED.
9. CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT.

TEMPORARY SEEDING SCHEDULE

SEEDING DATE	SEEDING MIXTURE	APPLICATION RATE
JAN 1 - MAY 1	RYE (GRAIN)	120 LBS/AC
	KOBE LESPEDEZA	50 LBS/AC
MAY 1 - AUG 15	GERMAN MILLET	40 LBS/AC
AUG 15 - DEC 30	RYE (GRAIN)	120 LBS/AC

SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 750 LB/AC 10-10-10 FERTILIZER FROM AUG 15 - DEC 30. INCREASE 10-10-10 FERTILIZER TO 1000 LB/AC.

MULCH
APPLY 4000 LB/AC STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET MEDIUM STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE

JAN 1 - AUG 15:	REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.
AUG 15 - DEC 30:	REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOP DRESS WITH 50 LB/AC OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND AUG 15, OVERSEED WITH 50 LB/AC KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

NOTE: USE THE TEMPORARY SEEDING SCHEDULE ONLY WHEN DATE IS NOT CORRECT TO USE THE PERMANENT SEEDING SCHEDULE.

PERMANENT SEEDING SCHEDULE (DAM EMBANKMENTS)

SEEDING DATE	SEEDING MIXTURE OPTIONS (CHOOSE ONE)	APPLICATION RATE
MAY 1 - AUG 31	CENTIPEDE RAW	30 LBS/AC
APRIL 1 - SEPT 1	SUMMER MIX (80% HULLED BERMUDA/20% MILLET)	200 LBS/AC
OCT 1 - MARCH 1	FALL MIX (80% TALL FESCUE/20% ANNUAL RYEGRASS)	200 LBS/AC

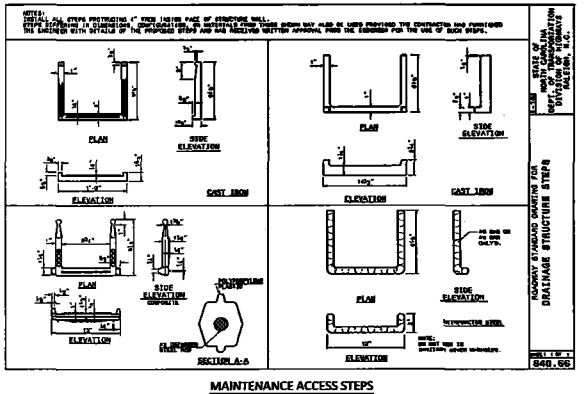
SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 1000 LB/AC 10-10-10 FERTILIZER.

MULCH
APPLY 4000 LB/AC STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET MEDIUM STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

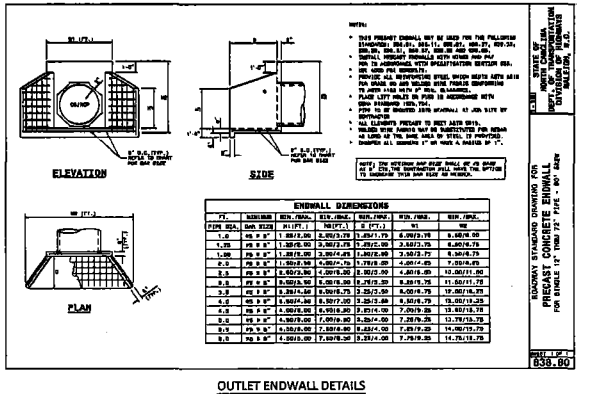
MAINTENANCE
INSPECT AND REPAIR MULCH FREQUENTLY. REFERTILIZE IN LATE WINTER OF THE FOLLOWING YEAR. USE SOIL TESTS OR APPLY 150 LB/AC 10-10-10 FERTILIZER. MOW REGULARLY TO A HEIGHT OF 2-4 INCHES.

NOTE: PERMANENT SEEDING SCHEDULE IS FOR SLOPES OF THE BASIN AND TOP OF BERM.

SEEDING SPECIFICATIONS



MAINTENANCE ACCESS STEPS
N.T.S.



OUTLET ENDWALL DETAILS
N.T.S.

THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.

FINAL SCM DESIGN SUBJECT TO CHANGE BASED ON REVIEW DURING FINAL DEVELOPMENT OF EACH LOT.

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be altered once issued. Any modifications to this approved once issued will invalidate this approval.

City of Raleigh Development Approval _____

City of Raleigh Review Officer

FINAL DRAWING - RELEASED FOR CONSTRUCTION

McAdams
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

CLIENT

LENNAR
1100 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5939

LENNAR

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33828 NOTARIAL SEAL

REVISIONS

NO.	DATE

PLAN INFORMATION

PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWA
CHECKED BY	RCA
DRAWN BY	MJP
SCALE	NTS
DATE	01. 05. 2022

SHEET

STORMWATER CONTROL MEASURE "A" DETAILS

C9.A4

BK019403PG01122

STORMWATER CONTROL MEASURE "A" LANDSCAPE SPECIFICATIONS

LEGEND

QTY.	SYM.	SCIENTIFIC NAME	COMMON NAME	HATCH	TYPE	SPACING
SHALLOW WATER						
259	AA	ACORUS AMERICANUS	SWEET FLAG		4-INCH CONTAINER	24" O.C.
186	PC	PONTEDERIA CORDATA	PICKERELWEED		4-INCH CONTAINER	24" O.C.
355	SC	SAURURUS CERNUUS	LIZARD'S TAIL		4-INCH CONTAINER	24" O.C.
433	CF	CANNA FLACCIDA	YELLOW CANNA		4-INCH CONTAINER	24" O.C.
SHALLOW LAND						
183	HA	HELIANTHUS ANGUSTIFOLIUS	SWAMP SUNFLOWER		4-INCH CONTAINER	24" O.C.
403	JE	JUNCUS EFFUSUS	SOFT RUSH		4-INCH CONTAINER	24" O.C.
224	SN	SYMPHYOTRICHUM NOVAE-ANGLIAE	NEW ENGLAND ASTER		4-INCH CONTAINER	24" O.C.

(ASSUMED 1 STEM PER 4 SF FOR ALL CALCULATIONS)

SEEDBED PREPARATION

1. CHISEL COMPACTED AREA AND SPREAD TOPSOIL 3-4 INCHES DEEP OVER ADVERSE SOIL CONDITIONS. TOPSOIL SHOULD BE INCORPORATED INTO THE FINAL GRADING OF THE AQUATIC SHELF AND BASIN SIDE SLOPES. CONTRACTOR SHOULD SCARIFY THE TOP 3-4 INCHES OF THE COMPACTED FILL TO PROMOTE BONDING WITH TOPSOIL.
2. RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. PER ONE TIME ONLY, APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL.
5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
6. SEED ON A FRESHLY PREPARED SEEDBED AND COVER.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. AFTER PERMANENT COVER IS ESTABLISHED.
9. *CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT*

TEMPORARY SEEDING SCHEDULE

SEEDING DATE	SEEDING MIXTURE	APPLICATION RATE
JAN 1 – MAY 1	RYE (GRAIN)	120 LBS/AC
	KOBE LESPEDEZA	50 LBS/AC
MAY 1 – AUG 15	GERMAN MILLET	40 LBS/AC
AUG 15 – DEC 30	RYE (GRAIN)	120 LBS/AC

SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 750 LB/AC 10-10-10 FERTILIZER (FROM AUG 15 – DEC 30, INCREASE 10-10-10 FERTILIZER TO 1000 LB/AC).

MULCH
APPLY 4000 LB/AC STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE
JAN 1 – AUG 15: REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

AUG 15 – DEC 30: REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOP DRESS WITH 50 LB/AC OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/AC KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

NOTE: USE THE TEMPORARY SEEDING SCHEDULE ONLY WHEN DATE IS NOT CORRECT TO USE THE PERMANENT SEEDING SCHEDULE.

PERMANENT SEEDING SCHEDULE (DAM EMBANKMENTS)

SEEDING DATE	SEEDING MIXTURE	APPLICATION RATE
AUG 25 – OCT (BEST)	TALL FESCUE	200 LBS/AC
FEB – APR 15 (POSSIBLE)		

SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 1000 LB/AC 10-10-10 FERTILIZER.

MULCH
APPLY 4000 LB/AC STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE
INSPECT AND REPAIR MULCH FREQUENTLY. REFERTILIZE IN LATE WINTER OF THE FOLLOWING YEAR; USE SOIL TESTS OR APPLY 150 LB/AC 10-10-10 FERTILIZER. MOW REGULARLY TO A HEIGHT OF 2-4 INCHES.

NOTE: PERMANENT SEEDING SCHEDULE IS FOR SLOPES OF THE BASIN AND DAM EMBANKMENT.

PLANTING INSTRUCTIONS

PLANTING TECHNIQUES
A. INSURE THAT ROOTS, ONCE REMOVED FROM POT, ARE STRAIGHTENED AND FACE DOWNWARD.
B. CREATE PLANTING AREA FOR EACH PLANT AND EXCAVATE PIT.
C. PLACE PLANTS IN PIT INSURING ROOTS ARE FACING COMPLETELY DOWNWARD.
D. HEEL IN SOIL AROUOND PLANT AND PROCEED TO NEXT PLANTING LOCATION.
E. NEWLY PLANTED PLANTS NEED TO BE FASTENED TO THE SUBSTRATE FOR THE ESTABLISHMENT OF NEW ROOTS.
F. ROOTS SHALL BE SPREAD IN THEIR NORMAL POSITION. ALL BROKEN OR FRAYED ROOTS HALL BE CUT OFF CLEANLY.
G. THE DIAMETER OF THE PITS FOR ALL VEGETATIVE STOCK SHALL BE AT LEAST THREE TIMES THE DIAMETER OF THE ROOT MASS. PLANT PIT WALL SHALL BE SCARIFIED PRIOR TO PLANT INSTALLATION.
H. SET THE PLANTS UPRIGHT, IN THE CENTER OF THE PIT. THE BOTTOM OF THE ROOT MASS SHOULD BE RESTING ON UNDISTURBED SOIL.
I. PLACE THE BACKFILL AROUND THE BASE AND SIDES OF THE ROOT MASS, AND WORK EACH LAYER TO SETTLE BACKFILL AND TO ELIMINATE VOIDS AND AIR POCKETS. WHEN PIT IS APPROXIMATELY 2/3 FULL, WATER THOROUGHLY BEFORE PLACING REMAINDER OF THE BACKFILL. WATER AGAIN AFTER PLACING FINAL LAYER OF BACKFILL.
J. BROKEN OR DAMAGED PARTS WILL BE CUT BACK TO UNDAMAGED TISSUE, LEAVING AS MUCH GREEN BASAL TISSUE AS POSSIBLE ABOVE THE ROOTS. IF MORE THAN FIFTY PERCENT (50%) OF THE PLANT IS DAMAGED THEN CONTRACTOR SHALL REPLACE THE PLANT.

CONTAINER STOCK / BARE ROOT
A. STOCK SHALL HAVE BEEN GROWN IN A CONTAINER LONG ENOUGH FOR THE ROOT SYSTEM TO HAVE DEVELOPED SUFFICIENTLY TO HOLD ITS SOIL TOGETHER ONCE REMOVED FROM THE CONTAINER.
B. CONTAINER PLANTS WILL NEED TO BE WATERED REGULARLY AND PLACED IN SHADY CONDITIONS UNTIL PLANTING OCCURS.
C. BARE ROOT PLANTS ARE FOR IMMEDIATE PLANTING, OTHERWISE SEE D) BELOW.
D. IF BARE ROOTS SPECIMENS ARE NOT TO BE PLANTED WITHIN FOUR (4) DAYS. TEMPORARY HOLDING OF BARE ROOT SPECIMENS ARE TO BE COVERED ENTIRELY BY A SUITABLE MEDIUM (ETC. SOIL, SAWDUST, MULCH OR THE LIKE) AND WATERED REGULARLY SO AS TO NOT DRY OUT.

PLANT LOCATIONS
A. NEW PLANTIINGS SHALL BE LOCATED WHERE SHOWN ON PLAN EXCEPT WHERE CHANGES HAVE BEEN MADE IN PROPOSED CONSTRUCTION.
B. NECESSARY ADJUSTMENTS SHALL BE MADE ONLY AFTER APPROVAL BY THE OWNER OR THE OWNER'S REPRESENTATIVE.

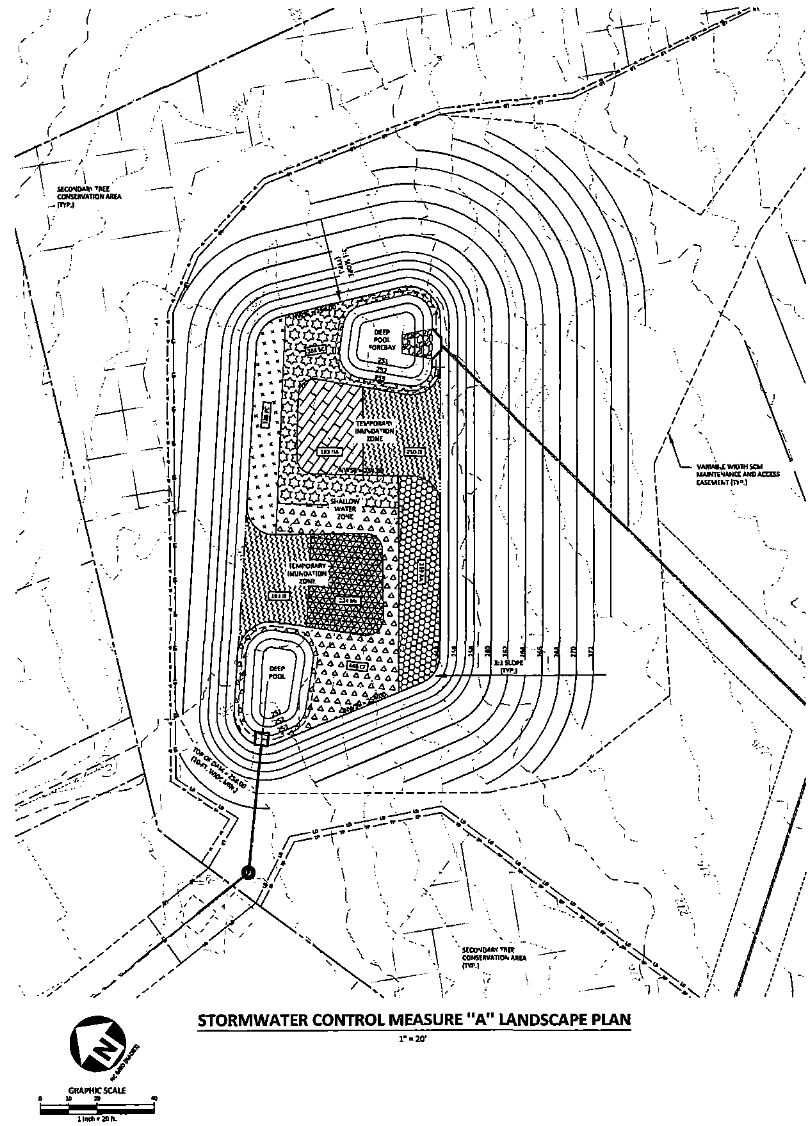
WATER
A. WATER SHALL BE POTABLE AND SHALL NOT CONTAIN ELEMENTS TOXIC TO PLANT LIFE.

PLANTING SCHEDULE

1. ONCE THE GRADING IS COMPLETE, THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO INSTALLATION OF THE STORMWATER MANAGEMENT FACILITY PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED VEGETATION PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE.
2. ONCE THE ENGINEER HAS APPROVED THE AS-BUILT GRADING, THE CONTRACTOR SHALL PLANT THE PROPOSED STORMWATER MANAGEMENT FACILITY PLANTS SHOWN ON THE LANDSCAPE PLAN FOR THE FACILITY. AFTER COMPLETION OF THE PLANTING, THE LANDSCAPE CONTRACTOR SHALL PROVIDE A LETTER TO THE ENGINEER CERTIFYING THAT THE PLANTS HAVE BEEN INSTALLED PER THE APPROVED STORMWATER MANAGEMENT FACILITY PLANTING PLAN.
3. OPTIMAL PLANTING PERIODS RANGE APPROXIMATELY FROM APRIL 15TH THRU JUNE 30TH AND SEPTEMBER 1ST THRU OCTOBER 31ST. FOR FINAL DETERMINATION OF THE SITE'S PLANTING PERIOD, THE CONTRACTOR SHALL COORDINATE WITH A LANDSCAPE PROFESSIONAL REGARDING SCHEDULING FOR PLANT INSTALLATION.
4. IT IS RECOMMENDED THAT THE CONTRACTOR TAKE MEASURES TO PREVENT WILDLIFE FROM DAMAGING OR CONSUMING WETLAND PLANTINGS.

NOTE: TOPSOIL SHOULD BE INCORPORATED INTO THE FINAL GRADING OF THE AQUATIC SHELF. CONTRACTOR SHOULD SCARIFY THE TOP 3- TO 4-INCHES OF THE COMPACTED FILL TO PROMOTE BONDING WITH TOPSOIL.

THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.



STORMWATER CONTROL MEASURE "A" LANDSCAPE PLAN
1" = 20'

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION
[illegible]

[illegible]

City of Raleigh Development Approval ______________________
City of Raleigh Review Officer

FINAL DRAWING - RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT
LENNAR
1100 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

REVISIONS
NO. DATE

PLAN INFORMATION

PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWA
CHECKED BY	RCA
DRAWN BY	MJP
SCALE	1" = 20'
DATE	01. 05. 2022

SHEET
STORMWATER CONTROL MEASURE "A" LANDSCAPE PLAN
C9.A5

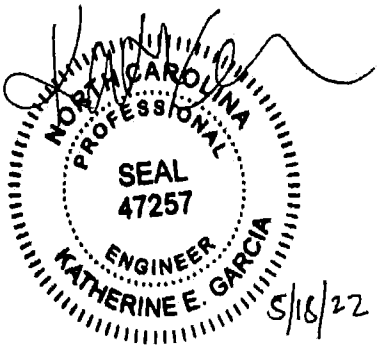
HUNTER'S POINTE

RALEIGH, NORTH CAROLINA

OPERATIONS AND MAINTENANCE MANUAL AND BUDGET FOR SCM B - WET POND

PROJECT NUMBER: LEN-20060
DESIGNED BY: K. GARCIA, PE
S. DANIELL, PE

DATE: MAY 2022



McADAMS
2905 MERIDIAN PARKWAY
DURHAM, NORTH CAROLINA 27713
NC LIC. # C-0293

HUNTER'S POINTE

Operations and Maintenance Manual and Budget for SCM B – Wet Pond

General Description

The proposed Hunter's Pointe development is an approximately 32.4-acre proposed single-family development located north of White Kestrel Drive and east of Cashew Drive in Raleigh, North Carolina. The proposed Hunter's Pointe development site includes single-family home lots, roads, and associated infrastructure.

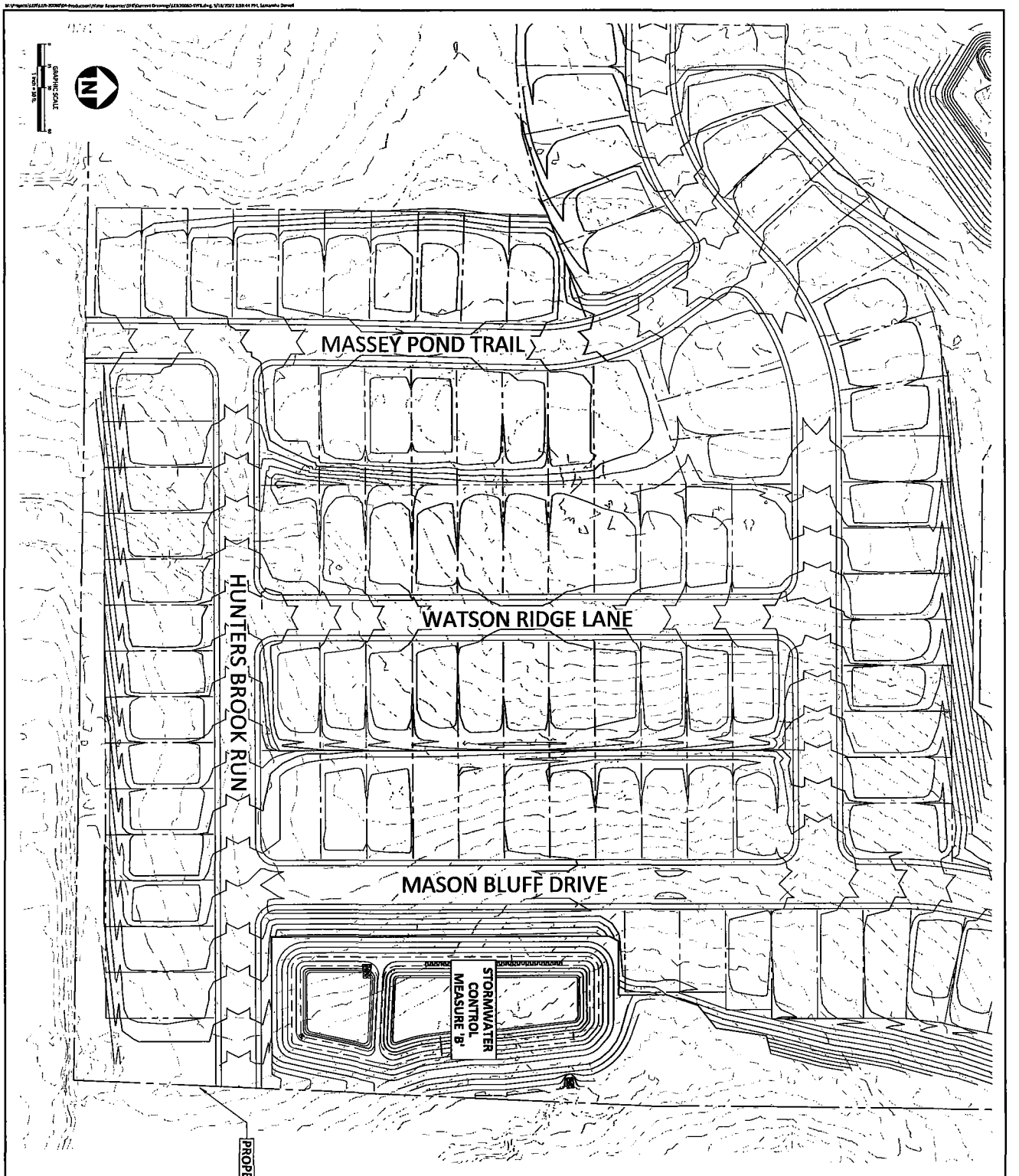
The proposed development drains to Harris Creek within the Neuse River basin. The proposed development shall be subject to the stormwater management requirements set forth in Section 9.2.2. of the City of Raleigh regulations. Per City of Raleigh regulations, stormwater management on this site shall address two primary issues: (1) peak discharge rates and (2) water quality management.

The proposed stormwater wet pond is located west of Forestville Road and south of Prelude Street. The bottom elevation of the pond is 235.00' for the main basin and 238.00' for the forebay. The top of dam elevation is 248.00' and normal pool elevation is 242.00'. The primary outlet structure is a 4' x 4' riser box connected to 39 LF of 36" diameter RCP pipe. A velocity dissipator is located at the end of the primary spillway. The dissipator is 12 feet in length and has an average stone size of 3 inches. A sediment forebay is located on the south side of the pond and will have a maximum depth of 4.00 feet. Plants to be used in the shelf of the pond are as follows: Sweetflag, Yellow Canna, American White Waterlily, Wool Grass, Giant Cutgrass, Common Rush, Soft Rush, Swamp Sunflower, Lizard's Tail, Redtop Panicgrass, and Golden Club.

For more details about the stormwater wet pond please refer to the Hunter's Pointe construction drawings prepared by The John R. McAdams Company, Inc.

Operations and Maintenance

This manual contains detailed instructions for maintenance, operation, and inspection for the stormwater wet pond. This manual also contains time intervals for these inspections and instructions for addressing any maintenance or repair issues. An inspection checklist has been included as well that should be used in all routine inspections of the stormwater wet pond. This Operations and Maintenance Manual should be utilized as a guideline for inspection biannually, monthly, and after each runoff producing event wherein greater than 1-inch of rainfall occurs over a 24-hour period. A rain gauge should be kept onsite in order to determine when this rainfall event occurs. This guide should also assist in determining any needs for repair. The Operations and Maintenance Checklist should be utilized to conduct the required inspections. The checklist may then be cross-referenced with the Operations and Maintenance Manual to assist the inspector to determine any repairs or actions needed. This manual should not be used as a replacement for an engineer's evaluation of the facility's condition. Rather, this manual is to be used during cursory, routine inspections of the facility. Actual determinations as to the need for repair and the actual repair to be conducted are to be determined by an engineer qualified for the type of work involved.



THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.

FINAL DRAWING - RELEASED FOR CONSTRUCTION

STORMWATER CONTROL MEASURE "B"
LOCATION MAP

SHEET

DATE 05.18.2022
SCALE 1" = 30'
DRAWN BY STD
CHECKED BY RCA
FILENAME LDR-70060-SW8
PROJECT NO. LDR-70060

PLAN INFORMATION

REVISIONS
NO. DATE

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

LENNAR

CLIENT
LENNAR
1100 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

MCADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

1	MAINTENANCE OF EMBANKMENTS
2	SEDIMENT MONITORING
3	MAINTENANCE OF OUTLET STRUCTURES
4	MAINTENANCE OF WET POND VEGETATION
5	RODENT / PEST CONTROL
6	PROPER WET POND WATER BALANCE
7	OPERATIONS
8	ANNUAL BUDGET AND REPLACEMENT FUND
9	INSPECTION CHECKLIST
10	STORMWATER WET POND DETAILS

SECTION I

MAINTENANCE OF EMBANKMENTS

I. MAINTENANCE OF EMBANKMENTS

A. Vegetation

The primary vegetative ground cover for all berm/embankments (excluding the berm of the wet pond) is to be tall fescue. Proper maintenance of this cover will serve to prevent erosion while providing optimal access for inspection as well as preventing excessive sediment from entering the facility. Fertilization of this vegetation should be performed bi-annually in October and April with fertilizer (12-12-12) at a minimum rate of 12 to 15 pounds per 1,000 SF. Woody vegetation and trees should not be allowed to propagate on the dam embankments or top of dam. Trees and brush, if desired, are acceptable on embankments other than the dam. Inspection of embankment vegetation condition should be performed monthly or after every rainfall event greater than 1 inch of rainfall over a 24-hour period.

1. Seeding: Seeding should be accomplished by the use of a spiker and large tractor aerifier to ensure proper seed and soil contact along the top of banks. The temporary and permanent seeding schedules are shown on the stormwater wet pond detail sheet, which has been included within this manual. Reseeding may be necessary in instances where initial seeding failed or existing areas have been compromised. The seeding schedules shown on the original design documents for the stormwater wet pond should be followed for any necessary reseeding.

2. Mowing: All vegetative cover should be maintained below 6" in height. Due to the slope of the embankments, string trimmers (no mechanical mowers) must be utilized for mowing turf. Mowing and maintenance should be performed once a month to keep the maximum grass height below 6 inches and to maintain appropriate turf cover and health of turf.

B. Erosion

Erosion is initiated when vegetative cover is insufficient and/or concentration of runoff destabilizes vegetation. Runoff then tends to concentrate into channel flow, and soils tend to become entrained in the water and be transported downstream. Unsuitable fill material, inadequate compaction, and/or poor stabilization of vegetation can accelerate the erosion process. This has a negative environmental impact on downstream features and has the potential to undermine the stability of the facility. Erosion can be minimized with the proper care of vegetation and the use of appropriate methods to repair eroded areas and prevent recurrences of eroded areas. Appropriately, compacted soil meeting the berm design requirements will be placed in any gullies or rills, and then reseeded as described above. Re-occurrence of erosive problems should be addressed with appropriate geotextile fabrics that are installed according to manufacturer's instructions and per an engineer's recommendation. Uneven surfaces on the crest of the berm may lead to the formation of rills and/or gullies. It is possible to eliminate this problem by properly filling any depressed areas such that the entire top of berm is flat and level. Addition of fill to the top of berm should be completed by first preparing the existing soil such that a distinct boundary layer does not form beneath existing soil and newly placed soil. New fill should meet all soil requirements (as to material, placement, and compaction) as stated on the

original design documents for this structure. Inspection for erosion should be performed monthly or after every major rainfall event.

1. Abutment (or toe) areas: The location where the fill of the berm contacts the existing ground is the abutment (or toe). Erosive channels have a tendency to form in these areas. Appropriate geotextile fabrics, as mentioned above, may be necessary to prevent or stop this form of erosion from occurring. If significant erosion is evident, as determined by the owner, an engineer is required to provide a remedial fix.

C. Seepage

1. Detection: Soft wet areas and flowing springs are an indication of seepage. Early indicators of seepage include vegetation which is more robust than surrounding vegetation. Vegetation normally associated with wetland areas such as cattails, ferns, reeds and mosses may also indicate the initiation of seepage. The previously described abutment (or toe) area is a common location for seepage to occur. Another common location for seepage problems is the area where the outlet structure exits the berm section. This is especially true in cases where the soil around the barrel is not compacted properly. Another problem related to seepage may be indicated by the occurrence of 'boils' below the abutment of the dam. These boils are springs that tend to deposit soils. Locating the occurrence of any boils should be included in the bi-annual inspection of the facility. 'Boils' are a possible indication of piping and could lead to berm failure. Piping occurs when a void space is formed within the interior of the berm embankment. These void spaces tend to be preferred paths for water to travel, which will erode the interior of the berm and lead to failure.

D. Cracks, Slides, Sloughing and Settlement

1. Cracks: Large, well-defined cracks of greater than ¼" width indicate the potential for serious problems and the inspector of the facility should be alert for their presence. Cracks in the berm generally follow one of two patterns:

   - Transverse cracks appear perpendicular to the length of the berm and may be caused by differential settlement. Transverse cracks increase the likelihood of the formation of piping and seepage.
   - Longitudinal cracks appear horizontally along the berm and could serve as warnings to a future slide event. Longitudinal cracks that appear within the first six months of a newly constructed berms may be an indication of poor compaction techniques and poor foundation preparation.

2. Slides: Slides and slumps have the potential to critically undermine the integrity of the berm. Arch-shaped cracks that expose soil indicate the initiation of slides. Detection of slides by inspectors should be addressed in a timely manner and a geotechnical engineer should be contacted for consultation.

3. Settlement: Settlement of the soil in the berm reduces freeboard in large storm events and may even lead to overtopping. Differential settlement of the berm can also lead to the concentration of runoff and therefore erosion as mentioned above. For this reason the berm should be maintained uniformly to its original design elevation. Greater than six inches of settlement may be indicative of significant issues within the berm foundation and could lead to catastrophic failure. Indications of this degree of settlement necessitate inspection by a geotechnical engineer.

4. Inspections for cracks, slides, sloughing, and settlement should be performed biannually. Actions to take if any of the above is detected: Any of the problems mentioned above require that a geotechnical or civil engineer be contacted, and that corrective action be taken.

SECTION II

SEDIMENT MONITORING

II. SEDIMENT MONITORING

A. Stormwater Wet Pond

Accumulation of sediment within the wet pond should be kept to a minimum by stabilization of the wet pond drainage area and proper prevention of erosion. Excess sediment accumulation within the wet pond area will cause suffocation of the vegetation, thus crippling the water quality function of the wet pond. Inspection for sediment deposition should be performed biannually.

1. Check the depth at various points within the wet pond, especially around the inlets to the pond and the bottom of the forebay. Accumulated sediment will be removed semiannually or when the depth reaches 6 inches or more. A stake shall be set during construction to indicate 6 inches of sediment accumulation. The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

2. Removed sediment shall be disposed of in an appropriate manner and shall be handled in a manner that will not adversely impact water quality (i.e. stockpiling near a wetland or surrounding streams).

3. If the elevation of the marsh areas exceeds the normal pool elevation, the sediment shall be removed to design levels. This shall be performed by removing the upper 6 inches of soil and stockpiling it. Then, the marsh shall be excavated 6 inches below design elevations. Afterwards, the stockpiled soil should be spread over the marsh surface. The soil shall not be stockpiled for more that 2 weeks. Any dead or damaged plants must be replaced after this process per the approved planting plan.

B. Forebay

Accumulation of sediment within the forebay area should be kept to a minimum by stabilization of the pond drainage area and proper prevention of erosion. Excess sediment accumulation within the forebay area will cause sediment transport to the pond area and subsequent suffocation of vegetation. Inspection for sediment deposition should be performed biannually.

1. Check the depth at various points within the forebay, around the inlets to the pond. Accumulated sediment will be removed semiannually or when the depth reaches 6 inches or more. A stake shall be set during construction to indicate 6 inches of sediment accumulation. The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

2. Removed sediment shall be disposed of in an appropriate manner and shall be handled in a manner that will not adversely impact water quality (i.e. stockpiling near the pond basin or streams).

C. Principal Spillway System

1. If present, remove accumulated sediment from the outlet structure. The principal spillway system should be inspected for sediment accumulation monthly or after every rainfall event greater than 1 inch of rainfall over a 24-hour period.

D. Storm Drainage System

1. The upstream storm drainage system should be maintained along with the stormwater wet pond. Trash from the site has a tendency to be washed into the storm drainage system and become lodged in the catch basins or pipes. The catch basins and pipes should be cleaned of debris at the time that maintenance is performed on the stormwater wet pond. Sediment may accumulate in portions of the storm drainage system where slopes are relatively flat. Sediment should be flushed annually or as needed, as determined by the owner. Steps should be taken to trap this "flushed" sediment at the entrance to the pond to prevent it from being deposited within the pond.

E. Pond De-watering

1. If the wet pond is to be de-watered for sediment removal purposes, it shall be done in a manner that does not drop normal pool elevations more that one (1) vertical foot per day. A geotechnical engineer shall be present on-site during any pond de-watering activities. If the basin must be drained for an emergency or to perform maintenance, then the flushing of sediment through the emergency drain shall be minimized to the maximum practical extent. Any dead or damaged plants must be replaced after this process per the approved planting plan.

SECTION III

MAINTENANCE OF OUTLET STRUCTURES

III. MAINTENANCE OF OUTLET STRUCTURES

The stormwater wet pond is designed to pass stormwater quality storms through the low flow orifice located in the riser structure. The stormwater wet pond is also designed to pass larger storm events through the secondary orifices in the riser structure and principal spillway. It is of vital importance that these structures remain unblocked so that the hydraulic functionality is not compromised. The outlet structure system should be inspected to ensure that it is functioning properly.

A. Low Flow Orifice

1. The stormwater wet pond drawdown device for this facility consists of a 6-inch PVC inverted intake with a 3-inch diameter orifice drilled in the bottom and a PVC cap in the top. In addition to maintaining the normal pool elevation of the wet pond, this device is responsible for drawing down the 1" water quality volume over a period of 2 to 5 days. However, in the event that the low flow orifice becomes blocked, the water level will rise to the elevation of the secondary orifices, which means that the water quality benefits associated with the wet pond are lost. The low flow orifice/inverted intake should be inspected for blockage monthly or after each major rainfall event. Debris causing the blockage should be promptly removed from the low flow orifice such that drawdown of the temporary pool occurs within 2 to 5 days, as designed.

B. Principal Spillway

1. The principal spillway for the stormwater wet pond consists of a 4' x 4' square weir box structure attached to a 36-inch RCP barrel. The principal spillway is responsible for safely conveying larger storm events through the facility. The principal spillway system is expected to remain robust throughout the life of the stormwater wet pond, but periodic inspection of the system is required. This inspection should occur biannually. The inspector should check for the presence of spalling, scaling, or cracking in the spillway system. Spalling is evident when pieces of concrete fall from the main pipe. It is defined as breaking, chipping, or fraying of concrete slabs that leave an uneven surface or edge, most often at joints or cracks. Scaling occurs when the surface of the concrete begins to flake off. The presence of cracking is indicated by separations in the concrete that are not located in the joints. Cracking can indicate the presence of structural problems and lead to leaks. Cracking can cause loss of the water tightness of the system, which can lead to piping (i.e. migration of soil particles into the pipe). If piping occurs, the risk of failure of the dam structure is greatly increased. Evidence of any of the above issues requires that an engineer be contacted for additional inspection to determine the need for repairs.

2. If the principal spillway system becomes blocked so that it does not operate at full capacity, the risk of dam overtopping or other uncontrolled releases may result. Therefore, to ensure hydraulic capacity of the spillways, the principal spillway system should be inspected for blockage monthly or after each major rainfall event. Any vegetative growth that occurs within the principal spillway system should be

removed promptly so that the full hydraulic capacity of the system is maintained.

C. Pond De-watering

1. If the Pond is to be de-watered for principal spillway system maintenance purposes, it shall be done in a manner that does not drop normal pool elevation more that one (1) vertical foot per day. A geotechnical engineer shall be present on-site during any de-watering activities. If the basin must be drained for an emergency, then the flushing of sediment through the emergency drain shall be minimized to the maximum practical extent.

SECTION IV

MAINTENANCE OF WET POND VEGETATION

IV. Maintenance of Wet Pond Vegetation

A. Wet Pond Vegetation

1. Due to the construction process and the near "optimal" conditions required to establish the wet pond vegetation, it is very likely that a portion of the initial wet pond plantings will not survive the first growing season due to factors such as lack of wet pond hydrology, variable water levels, plant selection, and sediment accumulations. Therefore, it is likely that additional vegetation will be required during the initial stage of development of the wet pond. Over longer periods of time, drought conditions or other factors may cause the wet pond vegetation to die off and therefore need replacement. Any wet pond vegetation requiring replacement should be in accordance with the original wet pond-planting plan, which has been included in this manual. Substitutes to any of the wetland vegetation are acceptable as determined by a landscape professional or engineer.

B. Wet Pond De-watering

1. If the wet pond is to be de-watered for wet pond vegetation repair/maintenance purposes, it shall be done in a manner that does not drop normal pool elevation more than one (1) vertical foot per day. A geotechnical engineer shall be present on-site during any wet pond de-watering activities. If the basin must be drained for an emergency, then the flushing of sediment through the emergency drain shall be minimized to the maximum practical extent.

SECTION V

RODENT / PEST CONTROL

V. ***RODENT / PEST CONTROL***

A. Embankments

1. Certain rodents including muskrats, ground hogs, and beavers tend to favor man-made earthen embankments as burrows. Evidence of the presence of such burrows requires the removal of the rodent and repair of any damage created by the presence of the rodent. Inspections for the presence of rodents within the embankment should be performed biannually.

SECTION VI

PROPER WET POND WATER BALANCE

VI. PROPER WET POND BLANCE

Crucial to the development of the stormwater wet pond is the maintaining of a proper water balance. If the wet pond is not sustaining an adequate water balance, steps should be taken to reestablish the appropriate wet pond hydrology.

A. Well Pump

1. Due to the relatively small drainage area to the wet pond, a well pump may be necessary to "irrigate" the wet pond to sustain a normal pool elevation that is conducive to wet pond plant growth and water quality functions. The well pump should be equipped with a float switch kit. When the normal pool elevation drops, the float switch would turn on the well pump, which would pump water into the wet pond, until the water level returns to normal pool elevation. Once the water level has retuned to normal pool elevation, the well pump would automatically turn off. The well pump should also be equipped with an operating switch from which the well pump can manually turned on or off.

2. The normal pool elevation should be inspected during each trip to the wet pond facility to ensure that it remains at the design level, and to ensure that the well pump, if installed, is operating properly. If at any time the inspector notices the normal pool elevation lower than design level, a well pump should be installed, or, if a well pump is already in use, it should be inspected to ensure proper operation. In the event that the well pump is not operating properly, either repair or replacement will be necessary.

3. Maintaining and preventing the wet pond from reaching a stagnant condition will greatly decrease the probability of mosquito breeding. Therefore, to prevent stagnation from occurring, the well pump, if installed, should be manually turned on at each semi-annual inspection and remain on until the wet pond has been completely "flushed".

4. If the wet pond is "flushed" at each semi-annual inspection, stagnation should not become a problem. However, if at any time a "stagnate" condition occurs within the wet pond, the well pump, if installed, should be manually turned on and remain on until the wet pond is completely "flushed". The wet pond is completely "flushed" when all evidence of stagnation has been removed and the water has returned to a "healthy" condition.

SECTION VII

OPERATIONS

VII. OPERATIONS

A. Record Keeping

The following records should be maintained:

1. Maintenance and Repair:

All instances of maintenance and repair should be logged and stored in Section IX of this manual.

- Bi-annual inspection reports: The inspection checklist should be completed at each bi-annual inspection. The completed checklist and any additional comments should be retained in Section IX of this manual. Reseeding and fertilizing shall be undertaken in October and April.

- Monthly and post-rainfall inspection and other observations: Notation should be made of monthly and post-rainfall inspections. Additionally, other instances of noteworthy observation should be recorded. All of this information should be filed in Section IX of this manual. A post-rainfall inspection is required when rainfall exceeds one inch (1") in a 24-hour period (major rainfall event). Monthly inspections will be completed on the 15th of every month.

- An annual inspection report will be performed by a registered professional engineer and shall contain all the information required by Raleigh City Code Section 10-2028. The inspection report shall be on forms supplied by the City of Raleigh. The inspection report is due on the anniversary date the as-built drawings of the stormwater wet pond were first certified to the City of Raleigh. These reports should be sent to Raleigh City Public Works Department, Stormwater Division, P.O. Box 590, Raleigh, NC 27602. Any discrepancies noted in the inspections shall be corrected within thirty (30) days.

SECTION VIII

ANNUAL BUDGET AND REPLACEMENT FUND

VIII. ANNUAL BUDGET AND REPLACEMENT FUND

A. Opinion of Annual Budget

Item	Approximate Yearly Cost*
Mowing	$1,200
Seeding	$750
Fertilizer/ Lime	$150
Embankment Repair	$750
Trash Removal	$600
Sediment Removal	$2,000
Outlet Structure Maintenance (Includes Rip Rap)	$500
Rodent Control	$250
Mosquito Briquettes	$500
Professional Inspection	$1,200
Annual Replacement Cost (Total Estimated Construction Cost/30 Years)	$2,621.29
Premiums for Liability and Casualty Insurance	$300
Total Average Yearly Maintenance Cost =	$10,821.29

**Note:*
Costs presented are approximate and are the design engineer's best estimate based on experience. The design engineer assumes no liability for the costs presented above. The costs are shown only as a general guide. Costs are shown as an average yearly value. Maintenance items such as the spillway structure and embankment may not require extensive maintenance for several years. Maintenance costs have been calculated accordingly.

B. Privately Maintained Sinking Fund Replacement Schedule

The total cost of this facility will be estimated to be $103,472.00. As with the annual maintenance budget costs listed above, this cost is an estimate, and therefore, the design engineer assumes no liability with regards to this issue.

In accordance with City of Raleigh regulations, the developer will pay, at the time of either recording a subdivision plat or issuance of a building permit for a lot not established by the subdivision, whichever event occurs first, twenty-four percent (24%) of the estimated replacement cost of this facility into a general replacement fund, which is maintained by the City of Raleigh. It is advisable that the remaining seventy-six percent (76%) be collected and deposited into a privately maintained account created on behalf of the property owner's association over the useful life of the facility, which is estimated to be thirty (30) years. The Engineer's Construction Cost Opinion and an estimated schedule for the private sinking fund are attached:

One Time Payment to City of Raleigh = 0.24 * Total Estimated Construction Cost
= 0.24 * $103,472.00 = $24,833.28

MCADAMS

Engineer's Cost Opinion for Performance Bonding

Project Name: Hunter's Point SCM 'B'
Project Number: LEN-20060

Date: 5/10/2022

Item No.	Description	Quantity	Unit	Unit Prices	Total
	Storm Drainage - Catch Basins (One structure up from inlet)				
1	JB-201	1.00	Ea	$ 3,500.00	$ 3,500
2	EW-200 30" NCDOT 838.01	2.30	CY	$ 2,015.00	$ 4,635
3	Rip-Rap Dissipater Class B(Inlet)	9.50	Ton	$ 45.00	$ 428
	Storm Drainage - Piping (One structure up from inlet)				
1	30" O-Ring RCP	66.00	LF	$ 100.00	$ 6,600
	SCM Components				
	Grading				$ -
1	Excavation	3.00	Days	$ 4,500.00	$ 13,500
2	Rough & Fine Grade	2.00	Days	$ 5,000.00	$ 10,000
3	Convert Temporary EC Measure into Permanent SCM	2.00	Days	$ 8,600.00	$ 17,200
	Internal				
1	Specialty Riser Structure 4'x4' Internal Dimensions (ea)	1	Ea	$ 3,820.00	$ 3,820
2	Specialty Riser Trash Rack (7'x7' Outside Dimensions) (ea)	1	Ea	$ 3,000.00	$ 3,000
3	Anti-Flotation Block w/Reinforced Concrete 8'x8'x1.5' (CY)	3.5	CY	$ 2,015.00	$ 7,053
4	Plug Valve & Stem Wheel (Ls)	1	Ls	$ 2,200.00	$ 2,200
5	8" DIP Drain w/Trash rack (Ls)	1	Ls	$ 750.00	$ 750
6	Concrete Collar w/# 4 rebar (ea)	1	Ea	$ 1,575.00	$ 1,575
	Riser + Outlet				
1	Concrete Cradle (cy)	27.25	CY	$ 350.00	$ 9,538
2	36 " O-Ring RCP Class III Pipe w/ Fabric wrapped joints (Lf)	39	Lf	$ 150.00	$ 5,850
3	4" Perforated weep drains Double-wall HDPE (ea)	2	EA	$ 75.00	$ 150
4	Velocity Disspator for 24" EW	5.5	TON	$ 45.00	$ 248
5	Rip Rap By-Pass Channel 4'Lx 9.5'W x 80" Thick (Ton)	12.5	TON	$ 45.00	$ 563
	Landscaping				
1	Wetland Plantings	1970.00	EA	$ 5.50	$ 10,835
2	Permanent Seeding	0.70	AC	$ 2,900.00	$ 2,030
	Total Site Direct Construction Cost				**$ 103,472**

Construction Cost = $ 103,472.00
Performance Bond = $ 129,340.00
125% of Direct Cost

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029808 FRED V. BOONE 5/10/2022

REPLACEMENT FUND SCHEDULE

Total Contract Amount =	$103,472.00	
Developer Portion to City =	24%	
=	$24,833.28	
Remaining Portion to be Collected =	76%	
Remaining Contract Amount =	$78,638.72	
Facility Life Expectancy =	30	years

Year	Replacement Amount [$]
1	$2,621.29
2	$2,621.29
3	$2,621.29
4	$2,621.29
5	$2,621.29
6	$2,621.29
7	$2,621.29
8	$2,621.29
9	$2,621.29
10	$2,621.29
11	$2,621.29
12	$2,621.29
13	$2,621.29
14	$2,621.29
15	$2,621.29
16	$2,621.29
17	$2,621.29
18	$2,621.29
19	$2,621.29
20	$2,621.29
21	$2,621.29
22	$2,621.29
23	$2,621.29
24	$2,621.29
25	$2,621.29
26	$2,621.29
27	$2,621.29
28	$2,621.29
29	$2,621.29
30	$2,621.29
Total =	$78,638.72

SECTION IX

INSPECTION CHECKLIST

IX. INSPECTION CHECKLIST

A. Monthly Inspection Items:

- The following items should be inspected monthly or after any significant rainfall event. Drainage:
  - Seepage Control
  - Abutment Contacts
  - Principal Spillway Outlet Structure
  - Embankment Vegetation
  - Low Flow Orifice/Inverted Intake
  - Wet Pond Plants
  - Soil Erosion
  - Pond Drawdown Time
  - Litter/Trash Accumulation
  - Mosquito Briquettes
  - Sediment and Outlet Structure
  - Trash Rack
  - Misc./Other

B. Semi-annual inspection:

1. The following items should be inspected semi-annually. The inspection checklist should be completed at each semi-annual inspection.
   - Top of Berm
   - Upstream Slope
   - Downstream Slope
   - Upstream Storm Drainage System
   - Spillway
   - Rodent Control
   - Two times a year, any trees, shrubs or other woody vegetation should be removed from the berm.
   - Sediment Depth

C. Bi-Annual Inspection Items:

1. The following items should be inspected bi-annually. The inspection checklist should be completed at each bi-annual inspection.
   - Top of Berm
   - Upstream Slope
   - Downstream Slope
   - Upstream Storm Drainage System
   - Spillway
   - Rodent Control

D. Annual Inspection:

- Once a year, the entire facility shall be inspected by a professional engineer. At this time, an annual inspection report will be completed, and shall contain all the information required by Raleigh City Code Section 10-2028. Refer to Section IX, Item C for further information.

DAM INSPECTION CHECKLIST
HUNTER'S POINTE - SCM B, WET POND

DATE OF INSPECTION: _____

To help the dam owner perform periodic safety inspections of the structure, a checklist is provided. Each item of the checklist should be completed. Repair is required when obvious problems are observed. Monitoring is recommended if there is potential for a problem to occur in the future. Investigation is necessary if the reason for the observed problem is not obvious.

A brief description should be made of any noted irregularities, needed maintenance, or problems. Abbreviations and short descriptions are recommended. Space at the bottom of the form should be used for any items not listed.

DAM _____	DATE _____	Y/N	MONITOR	REPAIR	INVESTIGATION
OWNER _____	WEATHER _____				
INSPECTED BY _____	POOL LEVEL _____				

Item	Comments				
1. CREST					
a. Visual settlement?					
b. Misalignment?					
c. Cracking?					
2. UPSTREAM SLOPE					
a. Erosion?					
b. Ground cover in good condition?					
c. Trees, shrubs, or other woody vegetation?					
d. Longitudinal/Vertical cracks?					
e. Adequate riprap protection?					
f. Stone deterioration?					
g. Settlements, depressions, or bulges?					
3. DOWNSTREAM SLOPE					
a. Erosion?					
b. Ground cover in good condition?					
c. Trees, shrubs, or other woody vegetation?					
d. Longitudinal/Vertical cracks?					
e. Adequate riprap protection?					
f. Settlements, depressions, or bulges?					
g. Soft spots or boggy areas?					
h. Movement at or beyond toe?					
i. Boils at toe?					
4. DRAINAGE-SEEPAGE CONTROL					
a. Seepage at toe?	Estimated _____ gpm				
b. Does seepage contain fines?					
5. ABUTMENT CONTACTS					
a. Erosion?					
b. Differential movement?					
c. Cracks?					
d. Seepage?	Estimated _____ gpm				
e. Adequate erosion protection for ditches?					
6. INLET STRUCTURE (Riser)	Concrete Box				
a. Seepage into structure?					
b. Debris or obstructions?					
c. If concrete, do surfaces show:					
1. Spalling?(Chipping, breaking up)					
2. Cracking? (other than hairline cracks)					
3. Erosion?					
4. Scaling? (flaking off, chipping)					
5. Exposed reinforcement?					
6. Other?					
d. If metal, do surfaces show:					
1. Corrosion?					
2. Protective Coating deficient?					
3. Misalignment or split seams?					
e. Do the joints show:					
1. Displacement or offset?					
2. Loss of joint material?					
3. Leakage?					
f. Are the trash racks:					
1. Broken or bent?					
2. Corroded or rusted?					
3. Obstructed?					
4. Operational?					

INSPECTION CHECKLIST- PAGE 2 INSPECTED BY _____ DATE_____		Y/N	MONITOR	REPAIR	INVESTIGATION
7. PRINCIPAL SPILLWAY PIPE	Concrete				
a. Seepage into conduit?					
b. Debris present?					
c. Do concrete surfaces show:					
1. Spalling?					
2. Cracking?					
3. Erosion?					
4. Scaling?					
5. Exposed reinforcement?					
6. Other?					
d. Do the joints show?					
1. Displacement or offset?					
2. Loss of joint material?					
3. Leakage?					
8. EMERGENCY SPILLWAY					
a. Erosion (gullies or rills)					
b. Exposed or damaged geotextile fibers?					
9. VELOCITY DISSIPATOR	Riprap				
a. Outlet channel obstructed?					
b. Is released water:					
1. Undercutting the outlet?					
2. Eroding the embankment?					
3. Displacing riprap?					
c. Tailwater elevation and flow condition?					
10. Resevoir					
a. High water marks?					
b. Erosion/Slides into wetland area?					
c. Sediment accumulation?					
d. Floating debris present?					
e. Adequate riprap protection for ditches?					
11. INTERIOR BERM					
a. Erosion?					
b. Visual Settling?					

Reference: 2000 Maryland Stormwater Design Manual- Volume II: Stormwater Design Appendices. Maryland Department of the Environment: Water Management Administration. Note this form is adapted and modified from the original version.

Raleigh

Stormwater Device
Annual Inspection Report Checklist

Please review the following checklist prior to submitting your stormwater device annual inspection report. The checklist will help you identify items that should be included in the annual inspection report. If you are missing an item, the report may get denied. Additional information may be requested by staff. Contact us with questions at scminspections@raleighnc.gov.

Initial Below

___ a. The report is being submitted within 30 days of the date the actual inspection took place.

___ b. The report is being submitted no more than 90 days prior to the site's anniversary date.

___ c. The report is completed and sealed by a North Carolina professional engineer, surveyor, or landscape architect.

___ d. A completed Form-501 is the cover-page of the report.

- ___ Section-A clearly identifies the site name, N-file number, and site/project address.
- ___ Section-B lists the best contact information for the property owner/representative or responsible party, if different from the tax record listed property owner.
- ___ Section-C identifies each device type that was inspected (if multiple).
- ___ Section-D lists the date the actual inspection occurred within the certification statement paragraph. (The date that the report was sealed should go next the certifiers signature and/or over their seal).

___ e. All devices in the report are referenced by the name/identifier used in the original stormwater management plans for the site.

___ f. If there are multiple devices in a report, the information and photos for each device are clearly separated and labeled.

___ g. The report includes a brief summary of site/device history, and current condition (i.e. recent weather, maintenance level, minor issues, deviation from approved plans, etc..).

___ h. Any repairs made over the past year are noted in the report, with descriptions of what work was completed and when. Before and after photos are recommended but not required.

___ i. If needed routine maintenance items or repairs are noted in the report, enough detail is provided so a property owner or maintenance staff can identify and address it. (i.e. include instructions on how and when the item should be addressed)

___ j. All photos are high resolution, color images at a visible scale with captions that clearly describe what the photo is depicting.

___1. Inspection photos that must be included in report (if present in device);

___ Main Treatment Area Overview
___ Emergency Spillway
___ Forebays
___ Inlet FES & Dissipators
___ Inside & Outside Riser Structure
___ Interior of Outlet Piping
___ Device Embankments
___ Earthen Berms/Weirs
___ Interior of Inlet Piping
___ Unobstructed Orifice(s)
___ Cleanouts/Underdrains
___ Outlet FES & Dissipators

___2. Reports with underground devices must include photos taken inside the device (confined space certification may be needed). Photos that must be included in the report (if present);

___ Overview of Contributory Site
___ Unobstructed Orifice(s)
___ Interior of Detention Piping
___ Interior of Outlet Piping
___ Inlet Structures (Inside & Out)
___ Weir Walls
___ Sediment/Sand Chambers
___Outlet Discharge Area

___ k. The report is a single PDF document and submitted as an email attachment to scminspections@raleighnc.gov.

For City Staff Use:
Date Received:
Date Accepted:
By:
Next Report Due:

Form-501
Stormwater Device
Annual Inspection Report Summary

Section A - Project Information

Project Name		N-File N-
Project Address		
City	State	Zip

Section B - Property Contact Information **best contact information for responsible party*

Property Owner/Contacts Name	Email	Phone	
Property Owner/Contacts Address	City	State	Zip
Recorded BK BM PG of lot for all required device(s)			

Section C – Stormwater Device Information

Additional pages are necessary to complete the stormwater device annual inspection report. The following items are to be included for each stormwater device; *initial* by each item as indication of inclusion:

____ **Narrative of general site condition**
____ **Device Type - Circle Device(s): (Wet Pond, Dry Pond, Wetland, Bioretention, UG Detention, Sand Filter, WQ Swale, Vegetative Filter Strip, Level Spreader, Permeable Pavement, Infiltration, PPUOS, Other: _____)**
____ **Disclosure of completed repairs**
____ **Site specific inspection charts/logs from the approved maintenance manual**
____ **Photographs of inspected stormwater device(s)**

____ **All items from the *Stormwater Device Annual Inspection Checklist* reviewed and addressed in report**

*Reports must be submitted in electronic form. All the above items must be included, and the report emailed to scminspections@raleighnc.gov as a **single** PDF attachment. Confirmation will be sent out within 5 days of receipt. If there is no response by the 5th day, please contact SCM Staff to make sure the report was received.

Section D - Surveyor, Engineer, or Landscape Architect Certification

I, _____, as a duly registered _____ in the State of North Carolina attest that on _____, 20____ a thorough inspection was conducted of this site to ensure all required stormwater control facilities including open space areas are performing properly and are in compliance with the approved stormwater control plan, the applicable maintenance manual required by Unified Development Ordinance (UDO) Sect 9.2.2(D) and the Raleigh Stormwater Control and Watercourse Buffer Manual. No sampling of pollutant loading is required as part of the inspection. All information provided is correct to the best of my knowledge. It is a violation of UDO 9.2.5(F) to falsify this certification. A civil penalty for falsifying this certification shall be assessed by the City of Raleigh in the amount of $3,000.00.

Certifier's Name	License Number		Place Seal Here
Title	Company Name	Email	
Address	City	State Zip	
Signature	Date	Telephone	

Annual Inspection Reports: Per Unified Development Ordinance 9.2.2(H) an original inspection report of all required stormwater control facilities, including open space areas, shall be filed with the City; due each year on the anniversary of the as-built certification date. Annual Inspection reports shall be accompanied by City provided 'Annual Inspection Report Summary' Form-501.

PO Box 590
One Exchange Plaza
Raleigh, NC 27602
Phone (919) 996-3776
www.raleighnc.gov

SECTION X

STORMWATER WET POND DETAILS

STORMWATER CONTROL MEASURE "B" CONSTRUCTION SPECIFICATIONS

GENERAL NOTES

1. PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE DESIGN ENGINEER'S ATTENTION IMMEDIATELY.

2. THE FINAL CERTIFICATION FOR THIS FACILITY WILL INCLUDE A CERTIFICATION BY THE ON-SITE GEOTECHNICAL ENGINEER THAT THE PROJECT WAS CONSTRUCTED PER THE APPROVED PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE ON-SITE GEOTECHNICAL ENGINEER FOR OBSERVATION AND TESTING SUCH THAT THE ON-SITE GEOTECHNICAL ENGINEER CAN CERTIFY THE CONSTRUCTION OF THE DAM EMBANKMENT AND SPILLWAY. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT AND SPILLWAY.

3. ALL CONSTRUCTION ACTIVITY RELATED TO THE PROPOSED STORMWATER CONTROL MEASURE SHALL BE PER THE DETAILS AND SPECIFICATIONS SHOWN IN THESE DRAWINGS. SOILS, COMPACTION, AND OTHER MISCELLANEOUS DETAILS AND SPECIFICATIONS MAY BE MODIFIED PER THE RECOMMENDATIONS OF THE ON-SITE GEOTECHNICAL ENGINEER. HOWEVER, PRIOR TO IMPLEMENTATION, THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DEVIATION FROM THESE DESIGN DRAWINGS, INCLUDING SHOP DRAWINGS FOR ANY PROPOSED MODIFICATION.

4. DURING THE INITIAL STAGES OF CONSTRUCTION, THE STORMWATER CONTROL MEASURE MAY BE USED AS A SEDIMENT BASIN FOR EROSION CONTROL PURPOSES. IF SO, THE CONTRACTOR SHALL FOLLOW THE GENERAL CONSTRUCTION SEQUENCE BELOW:
   - A. THE CONTRACTOR SHALL CONSTRUCT THE ENTIRE FACILITY (PERMANENT OUTLET STRUCTURE, DAM, ETC.) WITH THE EXCEPTION OF THE INTERIOR FINE GRADING FOR THE FACILITY. THE INTERIOR FINE GRADING WILL BE CONSTRUCTED ONCE THE EROSION CONTROL PHASE IS COMPLETE.
   - B. THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) SHALL BE CONNECTED TO THE PERMANENT 6"Ø DIP DRAIN PIPE.
   - C. ONCE THE UPSTREAM DRAINAGE AREA IS STABILIZED AND THE EROSION CONTROL INSPECTOR APPROVES THE REMOVAL OF THE SEDIMENT BASIN, THE CONTRACTOR SHALL REMOVE THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) AND CLEAN OUT THE BASIN. ALL SEDIMENT, TRASH, ETC. SHALL BE DISPOSED OF PROPERLY (I.E. - PLACED IN A LANDFILL) AND NOT STOCKPILED IN AN AREA WHERE WATER QUALITY COULD BE ADVERSELY AFFECTED.
   - D. ONCE THE BASIN IS CLEANED OUT, AND ALL EROSION CONTROL DEVICES REMOVED, THE CONTRACTOR SHALL CONSTRUCT THE INTERIOR GRADING SHOWN ON THIS SHEET.
   - E. ONCE THE GRADING IS COMPLETE, THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO INSTALLATION OF THE STORMWATER CONTROL MEASURE PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED VEGETATION PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE.
   - F. ONCE THE ENGINEER HAS APPROVED THE AS-BUILT GRADING, THE CONTRACTOR SHALL PLANT THE PROPOSED STORMWATER CONTROL MEASURE PLANTS SHOWN ON THE LANDSCAPE PLAN FOR THE FACILITY. AFTER COMPLETION OF THE PLANTING, THE LANDSCAPE CONTRACTOR SHALL PROVIDE A LETTER TO THE ENGINEER CERTIFYING THAT THE PLANTS HAVE BEEN INSTALLED PER THE APPROVED STORMWATER CONTROL MEASURE PLANTING PLAN.

5. ALL OSHA REQUIREMENTS FOR EXCAVATIONS (SHORING, DEPTH, ETC.) ARE THE RESPONSIBILITY OF THE CONTRACTOR. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE AN EXCAVATION PLAN TO BE SEALED BY A NC P.E. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE IF AN EXCAVATION PLAN IS REQUIRED. THE JOHN R. MCADAMS COMPANY ASSUMES NO RESPONSIBILITY FOR ANY EXCAVATION DESIGN RELATED TO SAFETY OR OSHA REQUIREMENTS.

6. ON-SITE GEOTECHNICAL ENGINEER TO DETERMINE IF IN-SITU SOILS ENCOUNTERED WOULD MAINTAIN A STORMWATER CONTROL MEASURE PERMANENT POOL AT DESIGN ELEVATION. IF HIGHLY PERMEABLE SOILS ARE ENCOUNTERED THAT, IN THE OPINION OF THE GEOTECHNICAL ENGINEER, WOULD NOT MAINTAIN THE PERMANENT POOL ELEVATION AS DESIGNED, A CLAY LINER MAY BE REQUIRED TO MAINTAIN A PERMANENT POOL OF WATER IN THE STORMWATER CONTROL MEASURE. DETERMINATION IF A CLAY LINER IS NEEDED SHALL BE THE RESPONSIBILITY OF THE ON-SITE GEOTECHNICAL ENGINEER. UPON DETERMINATION OF HIGHLY PERMEABLE SOIL CONDITIONS, ON-SITE GEOTECHNICAL ENGINEER WILL INFORM THE DESIGN ENGINEER. IF BLASTING IS REQUIRED DUE TO THE REMOVAL OF ROCK, A LINER SHALL BE REQUIRED.

7. IT IS ANTICIPATED THAT DEWATERING WILL BE NECESSARY IN THE EXCAVATION AREAS (E.G. - EMBANKMENT SUB GRADE, INTERIOR PORTIONS OF THE STORMWATER CONTROL MEASURE, KEY TRENCH, ETC.). THEREFORE, THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE STORMWATER CONTROL MEASURE SITE. DURING PLACEMENT OF FILL WITHIN THESE AREAS, THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION / CONSTRUCTION AREAS. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES ARE STABLE, WITH NO SEDIMENT DISCHARGED FROM THE SITE (I.E. PUMPED WATER MAY NEED TO BE DIRECTED TO AN APPROVED EROSION CONTROL DEVICE SUCH AS A DIRT BAG (ACF ENVIRONMENTAL) OR ENGINEER APPROVED EQUIVALENT, PRIOR TO DISCHARGE).

8. THE GRADES SHOWN ON THIS PLAN ARE FINISHED GRADES. IF THE EXISTING SOIL LAYER AFTER CONSTRUCTION / COMPACTION IS NOT DETERMINED SUITABLE BY A LANDSCAPE PROFESSIONAL FOR THE WET POND PLANTINGS, THEN THE CONTRACTOR SHALL AMEND THE PLANTING AREA OF THE WET POND AS DIRECTED BY A LANDSCAPE PROFESSIONAL.

9. PRIOR TO TOPSOIL INSTALLATION, THE CONTRACTOR SHALL SCARIFY THE TOP 2"-3" OF THE BERM SECTION TO PROMOTE BONDING OF THE TOPSOIL WITH THE COMPACTED FILL. THE TOPSOIL DEPTH SHALL RANGE FROM 3"-4" ON THE DAM EMBANKMENT AND AQUATIC SHELF. PLEASE NOTE THE TOPSOIL SHALL BE AMENDED, AS DIRECTED BY A LANDSCAPE PROFESSIONAL, PRIOR TO INSTALLATION ON THE EMBANKMENT AND AQUATIC SHELF.

10. THE CONTRACTOR SHALL REFER TO THE LANDSCAPE PLAN FOR THE PERMANENT PLANTING PLAN/SCHEDULE FOR THIS FACILITY. CONTRACTOR SHALL COORDINATE WITH A LANDSCAPE PROFESSIONAL REGARDING SCHEDULING FOR PLANT INSTALLATION. PLEASE NOTE THAT NO TREES/SHRUBS OF ANY TYPE MAY BE PLANTED ON THE PROPOSED DAM EMBANKMENT (FILL AREAS).

OUTLET STRUCTURE MATERIAL SPECIFICATIONS

1. THE 36"Ø RCP OUTLET BARREL SHALL BE CLASS III RCP, MODIFIED BELL AND SPIGOT, MEETING THE REQUIREMENTS OF ASTM C76-LATEST. THE PIPES SHALL HAVE CONFINED O-RING RUBBER GASKET JOINTS MEETING ASTM C-443-LATEST. THE PIPE JOINTS SHALL BE TYPE R-4.

2. THE STRUCTURAL DESIGN FOR THE 4' X 4' (INTERNAL DIMENSIONS) RISER BOX WITH EXTENDED BASE SHALL BE BY OTHERS. PRIOR TO ORDERING THE STRUCTURES, THE CONTRACTOR SHALL PROVIDE, TO THE DESIGN ENGINEER FOR REVIEW, SHOP DRAWINGS AND SUPPORTING STRUCTURAL CALCULATIONS SEALED BY A P.E. REGISTERED IN NORTH CAROLINA DEMONSTRATING THE PERTINENT VERTICAL LOADS ARE SUPPORTED BY THE CONCRETE RISER STRUCTURE.

3. THE RISER BOX OUTLET STRUCTURE SHALL BE PROVIDED WITH STEPS 16" ON CENTER. STEPS SHALL BE PROVIDED ON THE INNER WALL OF THE RISER BOX. STEPS SHALL BE IN ACCORDANCE WITH NCDOT STD. 840.66. PLEASE REFER TO SHEET C9.B2 FOR LOCATION OF THE RISER STEPS. NOTE THE STEPS SHALL LINE UP WITH THE ACCESS HATCH OF THE TRASH RACK.

4. THE CONCRETE ANTI-FLOTATION BLOCK SHALL BE CAST-IN-PLACE. STEEL REINFORCEMENT AND CONNECTION TO THE RISER SHALL BE PROVIDED IN ACCORDANCE WITH THE DETAIL ON SHEET C9.B4. THE CONTRACTOR SHALL ENSURE THE WEIGHT OF THE ENTIRE RISER STRUCTURE IS GREATER THAN OR EQUAL TO 40,826 LBS. IN LIEU OF CAST-IN-PLACE, THE CONTRACTOR MAY OPT FOR A PRECAST ANTI-FLOTATION BLOCK. SHOP DRAWINGS FOR THE PRECAST BLOCK SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE PRECAST ANTI-FLOTATION BLOCK SHALL HAVE A SHIPPING WEIGHT OF 28,400 LBS.

5. THE RISER BOX JOINTS SHALL BE SEALED USING BUTYL RUBBER SEALANT CONFORMING TO ASTM-C990-LATEST. IF NECESSARY, THE CONTRACTOR SHALL INCORPORATE A WATERSTOP INTO THE RISER BOX JOINT TO ENSURE A WATERTIGHT CONNECTION. THE CONTRACTOR SHALL PARGE JOINTS ON BOTH THE INSIDE AND OUTSIDE WITH NON-SHRINK GROUT AND INSTALL GALVANIZED STEEL STRAPS PER DETAIL ON SHEET C9.B2.

6. PRIOR TO ORDERING, THE CONTRACTOR SHALL SUBMIT TRASH RACK SHOP DRAWINGS TO THE ENGINEER FOR REVIEW. CONTRACTOR SHALL ENSURE THAT AN ACCESS HATCH IS PROVIDED WITHIN THE TRASH RACK (SEE DETAIL FOR LOCATION) THAT WILL ALLOW FOR FUTURE MAINTENANCE ACCESS. CONTRACTOR SHALL ALSO PROVIDE A CHAIN AND LOCK FOR SECURING THE ACCESS HATCH. NOTE THE ACCESS HATCH SHALL LINE UP WITH THE ACCESS STEPS AFTER INSTALLATION.

7. ALL POURED CONCRETE SHALL MEET THE FOLLOWING SPECIFICATIONS UNLESS OTHERWISE NOTED:
   - MINIMUM 3000 PSI (28 DAY)
   - SLUMP = 3" - 5"
   - ENTRAINED AIR = 5% - 7%

   PLEASE NOTE NO CONCRETE SHALL BE POURED WHEN THE AMBIENT AIR TEMPERATURES ARE EXPECTED TO BE ABOVE 85°F OR BELOW 40°F. CAST-IN-PLACE CONCRETE SHALL BE "WET CURED" AFTER FINISHING FOR A MINIMUM OF 48 HOURS.

   ON-SITE GEOTECHNICAL ENGINEER TO ENSURE AND CERTIFY ALL POURED CONCRETE MEETS THE ABOVE SPECIFICATIONS.

8. GEOTEXTILE FABRIC FOR THE 36"Ø RCP OUTLET BARREL JOINTS SHALL BE MIRAFI 180N OR ENGINEER APPROVED EQUAL (NON-WOVEN FABRIC)

9. STORMWATER CONTROL MEASURE EMERGENCY DRAW DOWN IS VIA AN 6"Ø PLUG VALVE. THE VALVE SHALL BE A M&H STYLE 1820 ECCENTRIC VALVE OR APPROVED EQUAL. THIS VALVE IS IN ACCORDANCE WITH AWWA C-517, AND SHALL BE OPERABLE FROM TOP OF OUTLET STRUCTURE VIA A HAND WHEEL (SEE DETAIL SHEET C9.B2). THE CONTRACTOR SHALL PROVIDE A REMOVABLE VALVE WRENCH WITH A HAND WHEEL ON TOP FOR OPERATION OF THE 6"Ø PLUG VALVE.

STATEMENT OF RESPONSIBILITY

1. ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THE STORMWATER CONTROL MEASURE SHALL BE THE RESPONSIBILITY OF THE OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.

THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.

CONSTRUCTION SEQUENCE

1. PRIOR TO CONSTRUCTION, THE OWNER SHALL OBTAIN A LAND DISTURBING (GRADING) PERMIT AND AN "APPROVAL TO CONSTRUCT" FROM THE CITY OF RALEIGH AND ALL OTHER NECESSARY PERMITS FROM APPLICABLE AGENCIES (E.G. 404 / 401 PERMITS)

2. INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES PER THE APPROVED SEDIMENT AND EROSION CONTROL PLAN. THE CONTRACTOR SHALL MAINTAIN ALL APPROVED SEDIMENT AND EROSION CONTROL MEASURES THROUGHOUT THE ENTIRE PROJECT, AS REQUIRED. THE CONTRACTOR SHALL RECEIVE APPROVAL FROM THE EROSION CONTROL INSPECTOR, AS REQUIRED BY GOVERNING AGENCIES, PRIOR TO ANY CLEARING.

3. CLEAR AND GRUB AREA WITHIN THE LIMITS OF THE PROPOSED DAM CONSTRUCTION. ALL TREES AND THEIR ENTIRE ROOT SYSTEMS MUST BE REMOVED FROM THE DAM FOOTPRINT AREA AND BACKFILLED WITH SUITABLE SOIL MATERIAL. THE BACKFILLED AREAS SHALL BE COMPACTED TO THE SAME STANDARDS AS THE DAM EMBANKMENT. THE REMAINING AREA OF THE EMBANKMENT SHALL BE STRIPPED TO A SUITABLE DEPTH AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER. ANY RESIDUAL SOILS TO BE LEFT IN PLACE MUST BE WELL SCARIFIED TO PROMOTE BONDING OF THE NEW EMBANKMENT FILL. NO EMBANKMENT MATERIAL SHALL BE PLACED FOR THE DAM OR KEY TRENCH UNTIL APPROVAL OF THE DAM SUBGRADE IS OBTAINED FROM THE ON-SITE GEOTECHNICAL ENGINEER.

4. EXCAVATE FOR THE NEW KEY TRENCH ALONG THE CENTERLINE OF THE PROPOSED DAM EMBANKMENT. THE TRENCH SHALL EXTEND A MINIMUM OF 5 FT BELOW EXISTING GRADE OR 2 FT BELOW THE 36"Ø RCP OUTLET BARREL AND SHALL HAVE A MINIMUM BOTTOM WIDTH OF 5 FEET. THE KEY TRENCH SIDESLOPES SHALL BE A MINIMUM OF 1:1 (H:V). WHEN EXCAVATING THE KEY TRENCH, IF ANY DEBRIS IS ENCOUNTERED TO AN EXTENT THAT SUCH DEBRIS MAY EXIST IN OTHER INSITU PORTIONS OF THE DAM EMBANKMENT, IT SHOULD ALSO BE REMOVED. THE KEY TRENCH SHALL BE COMPACTED TO THE SAME SPECIFICATION LISTED IN ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." DEPENDING UPON ON-SITE SOIL CONDITIONS ENCOUNTERED DURING EXCAVATION, THE ON-SITE GEOTECHNICAL ENGINEER MAY VARY THE DEPTH AND DIMENSIONS OF THE KEY TRENCH AS DEEMED NECESSARY. THE ON-SITE GEOTECHNICAL ENGINEER SHALL RETAIN DOCUMENTATION OF ANY VARIATION FOR FUTURE AS-BUILT SUBMITTALS TO THE CITY OF RALEIGH.

5. BEGIN PLACEMENT OF BACKFILL WITHIN THE KEY TRENCH. THE KEY TRENCH SHALL BE COMPACTED TO THE SPECIFICATIONS LISTED ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." THE KEY TRENCH SHALL BE TESTED PER THE SPECIFICATIONS LISTED IN THAT SECTION.

6. PRIOR TO INSTALLATION, SUBGRADE CONDITIONS ALONG THE SPILLWAY PIPES SHOULD BE EVALUATED BY THE ON-SITE GEOTECHNICAL ENGINEER TO ASSESS WHETHER SUITABLE BEARING CONDITIONS EXIST AT THE SUBGRADE LEVEL. SHOULD SOFT OR OTHERWISE UNSUITABLE CONDITIONS BE ENCOUNTERED ALONG THE PIPE ALIGNMENTS, THESE MATERIALS SHOULD BE UNDERCUT AS DIRECTED BY THE GEOTECHNICAL ENGINEER. THE UNDERCUT MATERIALS SHALL BE REPLACED WITH ADEQUATELY COMPACTED STRUCTURAL FILL, LEAN CONCRETE OR FLOWABLE FILL, AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.

7. IN ORDER TO HELP PROTECT THE SOIL SUBGRADE FROM DETERIORATION (DUE TO EXPOSURE, RAINFALL, SEEPAGE, AND RUNOFF) BEFORE THE CRADLE CAN BE POURED, IT IS STRONGLY RECOMMENDED THAT A 3" TO 4" THICK CONCRETE MUD MAT BE POURED OVER THE SUBGRADE ONCE IT IS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE MUD MAT WILL ALSO PROVIDE BEARING FOR THE BLOCKS THAT TEMPORARILY SUPPORT THE SPILLWAY PIPE UNTIL THE CRADLE CAN BE POURED. THE METHOD OF BLOCK SUPPORT FOR THE PIPE PROPOSED BY THE CONTRACTOR SHOULD BE SUBMITTED TO THE JOHN R. McADAMS COMPANY FOR REVIEW.

8. BEGIN CONSTRUCTION OF THE NEW EMBANKMENT. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8" THICK LIFTS PRIOR TO COMPACTION, UNLESS DIRECTED OTHERWISE BY THE ON-SITE GEOTECHNICAL ENGINEER. FILL LIFTS SHALL BE CONTINUOUS OVER THE ENTIRE LENGTH OF FILL. IF IT IS NECESSARY, THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO FINAL GRADE IN ORDER TO ACHIEVE PROPER COMPACTION.

9. AS CONSTRUCTION OF THE EMBANKMENT MOVES FORWARD, IT WILL BE NECESSARY TO INSTALL THE CONCRETE CRADLE. SEE NOTE ON CRADLE DETAIL (SHEET C9.B4). THIS MAY BE CONSTRUCTED USING ONE OF THE FOLLOWING METHODS:
   - A. IF THE PROPOSED STRUCTURAL FILL MATERIAL IS UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADLE, THEN THE STRUCTURAL FILL SHOULD BE INSTALLED AND COMPACTED UP TO THE TOP OF CONCRETE CRADLE ELEVATION. ONCE THE STRUCTURAL FILL REACHES THE NEXT DOWNSTREAM JUNCTION BOX OR HEADWALL AND IS COMPACTED TO THE ELEVATION OF THE TOP OF THE CONCRETE CRADLE, EXCAVATE THE CONCRETE CRADLE TRENCH PER THE PROVIDED DETAILS AND CONSTRUCT THE CONCRETE CRADLE AS PER THE PROVIDED CONCRETE CRADLE DETAIL.
   - B. IF THE PROPOSED STRUCTURAL FILL IS NOT UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADLE, THEN PRIOR TO CONSTRUCTING THE STRUCTURAL FILL EMBANKMENT, THE FORMWORK FOR THE CONCRETE CRADLE SHOULD BE INSTALLED ON EXISTING GROUND AND/OR THE MUD MAT. THE CONCRETE CRADLE SHALL BE CONSTRUCTED PER THE PROVIDED DETAILS.

10. AS AN ALTERNATE TO A CONCRETE CRADLE UNDER THE BARREL PIPE (SEE SHEET C9.B4), THE CONTRACTOR MAY CHOOSE TO ELIMINATE THE CONCRETE CRADLE AND USE COMPACTED BACKFILL IF THE ON-SITE GEOTECHNICAL ENGINEER WILL PROVIDE A NC PE SEALED LETTER CERTIFYING THAT THE COMPACTION UNDER, AROUND, AND ABOVE THE BARREL MEETS THE SPECIFICATIONS OF THE EMBANKMENT COMPACTION REQUIREMENTS AND MOISTURE CONTENT. THIS CERTIFICATION LETTER MUST BE SUBMITTED TO THE DESIGN ENGINEER PRIOR TO BACKFILL. THIS SEPARATE CERTIFICATION MUST BE SPECIFIC TO THE BARREL PIPE FOR THE FACILITY, AND MUST CLEARLY STATE THAT ALL SOIL MATERIAL UNDER, AROUND, AND ABOVE THE BARREL PIPE MEETS THE BERM AND SOIL COMPACTION SPECIFICATIONS ON THIS SHEET. THIS CERTIFICATION IS TO INCLUDE REFERENCE TO BOTH MATERIAL AND COMPACTION, AND MUST STATE THAT ALL MATERIALS UNDER, AROUND, AND ABOVE THE BARREL HAVE BEEN COMPACTED PER THE BERM MATERIAL SPECIFICATIONS (AT LEAST 95% OF MAXIMUM DRY DENSITY USING ASTM D698 STANDARD PROCTOR) WITH NO VOID SPACES PRESENT. THE CONTRACTORS INTENT TO UTILIZE THIS ALTERNATIVE MUST BE STATED PRIOR TO CONSTRUCTION TAKING PLACE. THIS CONTRACTORS CERTIFICATION MUST BE PRESENTED TO THE DESIGN ENGINEER BEFORE AN AS-BUILT CERTIFICATION CAN BE ISSUED FOR THIS FACILITY.

11. INSTALL RISER / BARREL ASSEMBLY, ALONG WITH THE EMERGENCY DRAIN SYSTEM. INSTALL 36" RCP OUTLET BARREL SPILLWAY FILTER FROM THE DETAILS SHOWN ON SHEET C9.B3.

12. CONSTRUCT EMBANKMENT PER SPECIFICATIONS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS" AND REQUIREMENTS OF THE ON-SITE GEOTECHNICAL ENGINEER. ALL CHARACTERISTICS OF THE EMBANKMENT FILL MATERIAL SHALL MEET THE STANDARDS SET FORTH IN "BERM AND SOIL COMPACTION SPECIFICATIONS", INCLUDING COMPACTION AND MOISTURE REQUIREMENTS. IF NECESSARY TO ACHIEVE PROPER COMPACTION, THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO PROPER FINAL GRADE. ANY HAND COMPACTION ACTIVITIES AROUND SPILLWAY OR DRAIN STRUCTURES SHALL BE CONDUCTED IN 4-INCH LOOSE LIFTS AND BE TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT. ALL COMPACTION AND MOISTURE TESTING SHALL BE CARRIED OUT AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER AND AS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS".

13. UPON COMPLETION OF DAM EMBANKMENT, PROMPTLY STABILIZE AND SEED DAM EMBANKMENT PER SEEDING SCHEDULE. PERMANENT GROUND COVER SHALL BE ESTABLISHED PER THE PERMANENT SEEDING SCHEDULE FOUND ON SHEET C9.04.

14. SCHEDULE A FINAL AS-BUILT INSPECTION AND AS-BUILT SURVEY WITH THE ENGINEER. AN AS-BUILT INSPECTION SHOULD BE SCHEDULED A MINIMUM OF 60 DAYS BEFORE A PERMIT TO IMPOUND IS REQUIRED. ANY COMMENTS OR DEFICIENCIES IN THE DAM CONSTRUCTION MUST BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AND OWNER BEFORE CERTIFICATION SHALL BE GRANTED.

BERM AND SOIL COMPACTION SPECIFICATIONS

1. PRIOR TO CONSTRUCTION, THE ON-SITE GEOTECHNICAL ENGINEER SHALL IDENTIFY BORROW / FILL AREAS AND VERIFY THEIR SUITABILITY FOR USE WITHIN THE DAM EMBANKMENT. ALSO, THE ON-SITE GEOTECHNICAL ENGINEER SHALL PERFORM STANDARD PROCTORS ON THE PROPOSED BORROW MATERIAL TO ENSURE THAT OPTIMUM MOISTURE CONTENT AND COMPACTION CAN BE ACHIEVED / CONTROLLED DURING CONSTRUCTION.

2. ALL FILL MATERIALS TO BE USED FOR THE DAM EMBANKMENT SHALL BE TAKEN FROM BORROW AREAS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE FILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS, WOOD, STONES GREATER THAN 6", AND FROZEN OR OTHER OBJECTIONABLE MATERIAL. THE FOLLOWING SOIL TYPES ARE SUITABLE FOR USE AS FILL WITHIN THE DAM EMBANKMENT AND KEY TRENCH: ML AND CL. ALL FILL MATERIALS SHALL BE APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER FOR THE INTENDED USE.

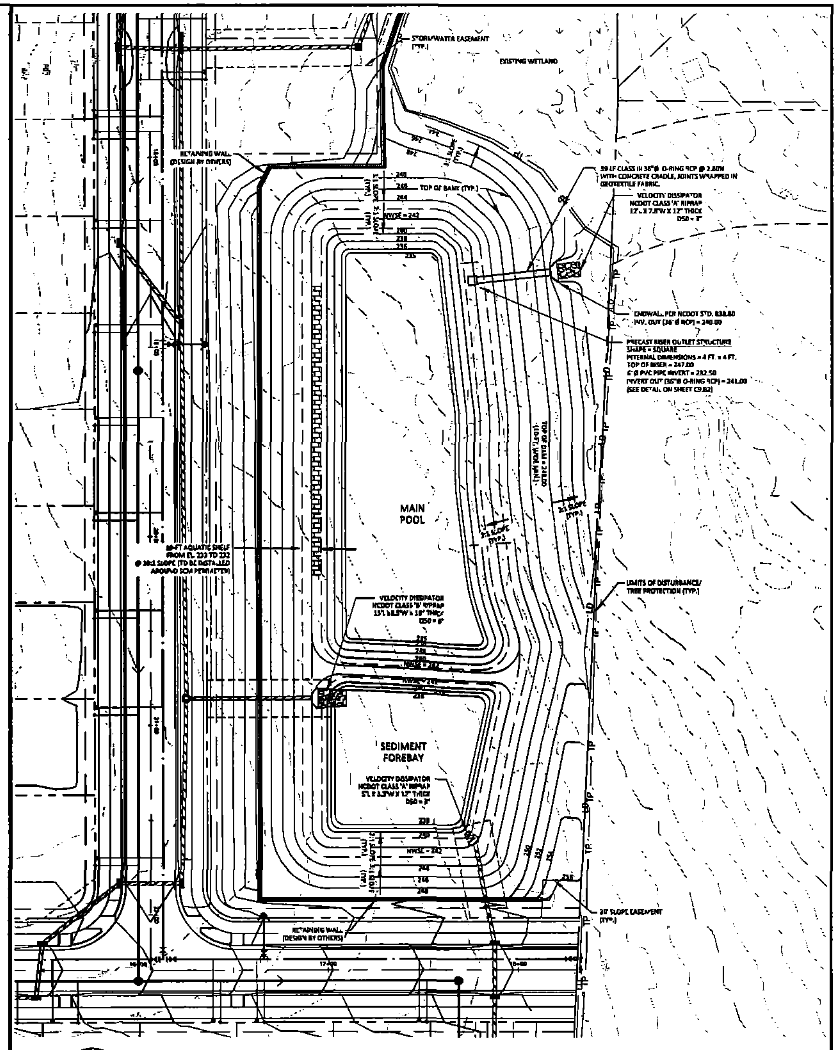
3. FILL PLACEMENT FOR THE EMBANKMENT SHALL NOT EXCEED A MAXIMUM 8" LIFT (UNCOMPACTED). EACH LIFT SHALL BE CONTINUOUS FOR THE ENTIRE LENGTH OF EMBANKMENT. BEFORE PLACEMENT OF FILL FOR THE BERM SECTION, ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND THE SURFACE PROPERLY PREPARED FOR FILL PLACEMENT. FILL MATERIAL ADJACENT TO ALL SPILLWAY AND DRAINAGE STRUCTURES SHALL BE PLACED IN 4-INCH (UNCOMPACTED) LIFTS AND HAND-COMPACTED TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT.

4. ALL FILL SOILS USED IN THE EMBANKMENT CONSTRUCTION SHALL BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN -1 TO +3 PERCENT OF ITS OPTIMUM MOISTURE CONTENT. COMPACTION TESTS SHALL BE PERFORMED BY THE ON-SITE GEOTECHNICAL ENGINEER DURING CONSTRUCTION TO VERIFY THAT THE PROPER COMPACTION LEVEL HAS BEEN REACHED. THE FILL SHOULD BE COMPACTED USING A SHEEPSFOOT TYPE COMPACTOR. IN ORDER TO PREVENT DAMAGE TO THE PIPE, NO COMPACTION EQUIPMENT SHALL CROSS ANY PIPE UNTIL MINIMUM COVER IS ESTABLISHED ALONG THE PIPE.

5. THE DESIGN ENGINEER SHALL BE PROVIDED WITH REPORTS AND CERTIFICATION, BY THE ON-SITE GEOTECHNICAL ENGINEER, THAT THE GEOTECHNICAL ASPECTS OF THE FACILITY HAVE BEEN CONSTRUCTED PER PLAN. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT AND SPILLWAY. THESE REPORTS AND CERTIFICATION WILL BE NEEDED DURING THE AS-BUILT CERTIFICATION PROCESS FOR THIS STORMWATER CONTROL MEASURE. THEREFORE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE TESTING AND OBSERVATION WITH THE ON-SITE GEOTECHNICAL ENGINEER.

6. TESTING OF THE NEW FILL MATERIALS SHALL BE PERFORMED TO VERIFY THAT THE RECOMMENDED LEVEL OF COMPACTION IS ACHIEVED DURING CONSTRUCTION. THEREFORE, ONE DENSITY TEST SHALL BE PERFORMED FOR EVERY 2,500 SQUARE FEET OF AREA FOR EVERY LIFT OF FILL OR AS RECOMMENDED BY THE ON-SITE GEOTECHNICAL ENGINEER.

7. TESTING WILL BE REQUIRED ALONG THE 36"Ø RCP OUTLET BARREL AT A FREQUENCY OF ONE TEST PER 25 LF OF PIPE PER VERTICAL FOOT OF FILL OR AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.



STORMWATER CONTROL MEASURE "B" PLAN VIEW

1" = 30'

GRAPHIC SCALE

1 inch = 30 ft.

FINAL SCM DESIGN SUBJECT TO CHANGE BASED ON REVIEW DURING FINAL DEVELOPMENT OF EACH LOT.

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval ____________________

City of Raleigh Review Officer

FINAL DRAWING – RELEASED FOR CONSTRUCTION

MCADAMS

The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

CLIENT

LENNAR
1100 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE

SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

REVISIONS

NO. DATE

PLAN INFORMATION

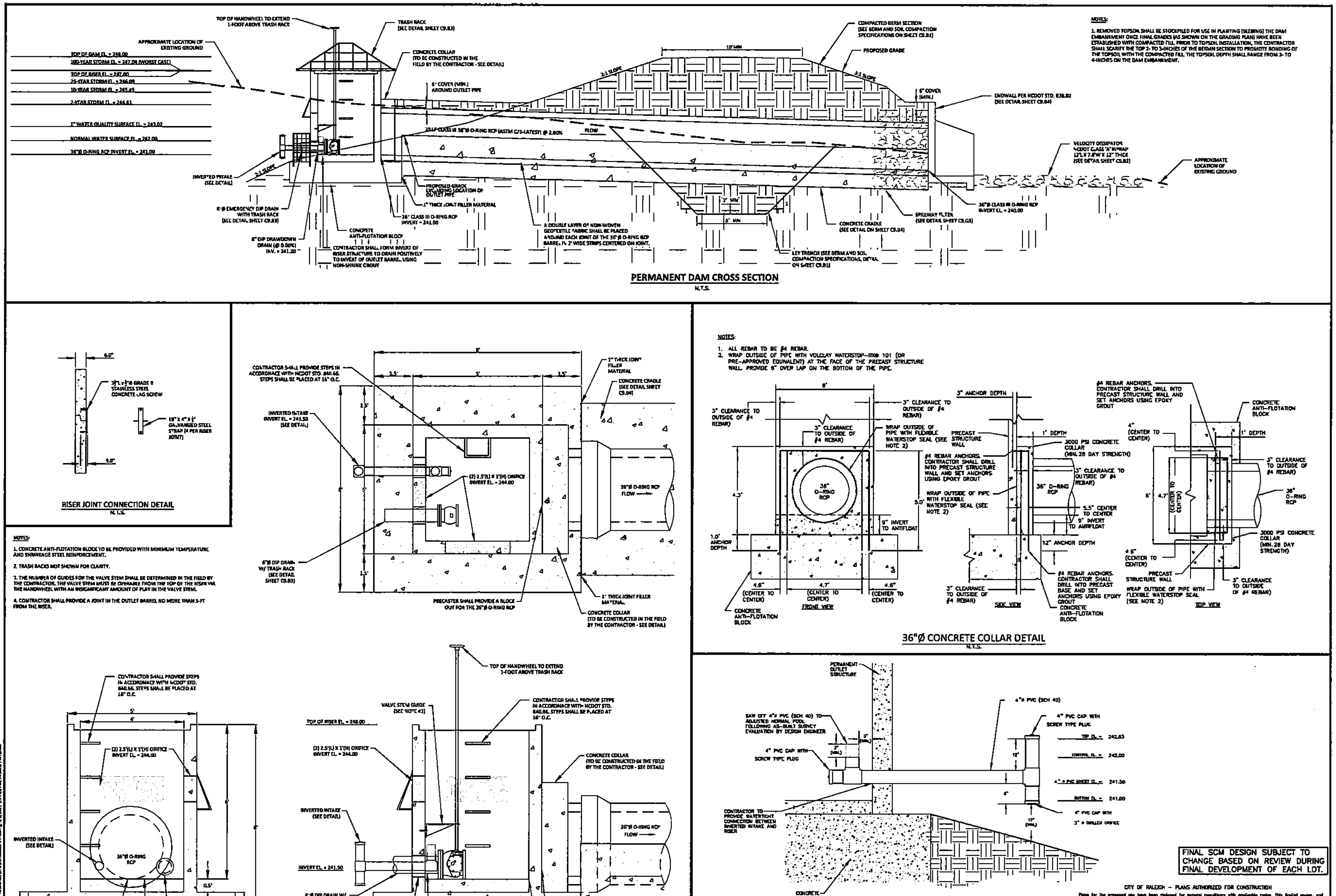
PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWB
CHECKED BY	RCA
DRAWN BY	MJP
SCALE	1" = 30'
DATE	01. 05. 2022

SHEET

STORMWATER CONTROL MEASURE "B" PLAN VIEW

C9.B1

BK019403PG01159


PERMANENT DAM CROSS SECTION
N.T.S.
NOTES:
1. REMOVED TOPSOIL SHALL BE STOCKPILED FOR USE IN PLANTING (SEEDING) THE DAM EMBANKMENT ONCE FINAL GRADES (AS SHOWN ON THE GRADING PLAN) HAVE BEEN ESTABLISHED WITH COMPACTED FILL. PRIOR TO TOPSOIL INSTALLATION, THE CONTRACTOR SHALL SCARIFY THE TOP 2- TO 3-INCHES OF THE BERM SECTION TO PROMOTE BONDING OF THE TOPSOIL WITH THE COMPACTED FILL. THE TOPSOIL DEPTH SHALL RANGE FROM 3- TO 4-INCHES ON THE DAM EMBANKMENT.
RISER JOINT CONNECTION DETAIL
N.T.S.
NOTES:
1. CONCRETE ANTI-FLOTATION BLOCK TO BE PROVIDED WITH MINIMUM TEMPERATURE AND SHRINKAGE STEEL REINFORCEMENT.
2. TRASH RACKS NOT SHOWN FOR CLARITY.
3. THE NUMBER OF GUIDES FOR THE VALVE STEM SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR. THE VALVE STEM MUST BE OPERABLE FROM THE TOP OF THE RISER VIA THE HANDWHEEL WITH AN INSIGNIFICANT AMOUNT OF PLAY IN THE VALVE STEM.
4. CONTRACTOR SHALL PROVIDE A JOINT IN THE OUTLET BARREL NO MORE THAN 5-FT FROM THE RISER.
PERMANENT OUTLET STRUCTURE DETAIL
N.T.S.
NOTES:
1. ALL REBAR TO BE #4 REBAR.
2. WRAP OUTSIDE OF PIPE WITH VOLCLAY WATERSTOP-RX® 101 (OR PRE-APPROVED EQUIVALENT) AT THE FACE OF THE PRECAST STRUCTURE WALL. PROVIDE 6" OVER LAP ON THE BOTTOM OF THE PIPE.
36"Ø CONCRETE COLLAR DETAIL
N.T.S.
INVERTED INTAKE OUTLET DETAIL

FINAL SCM DESIGN SUBJECT TO CHANGE BASED ON REVIEW DURING FINAL DEVELOPMENT OF EACH LOT.

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval ____________________
City of Raleigh Review Officer

FINAL DRAWING - RELEASED FOR CONSTRUCTION

THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

CLIENT

LENNAR
1100 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

NORTH CAROLINA PROFESSIONAL SEAL 33828 ENGINEER RYAN C. AKERS
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

NO. DATE

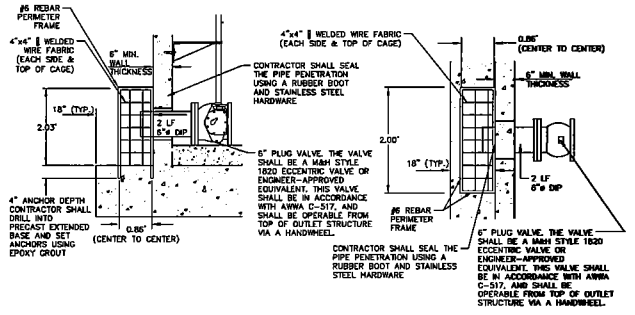
PLAN INFORMATION

PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWB
CHECKED BY	RCA
DRAWN BY	MJP
SCALE	NTS
DATE	01. 05. 2022

SHEET

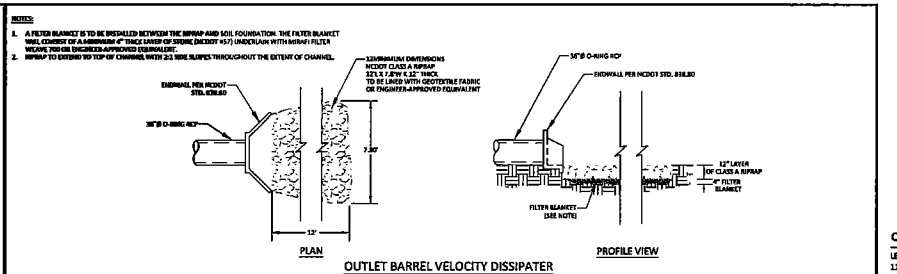
STORMWATER CONTROL MEASURE "B" DETAILS

C9.B2



6"Ø EMERGENCY DIP DRAIN TRASH RACK DETAILS

N.T.S.

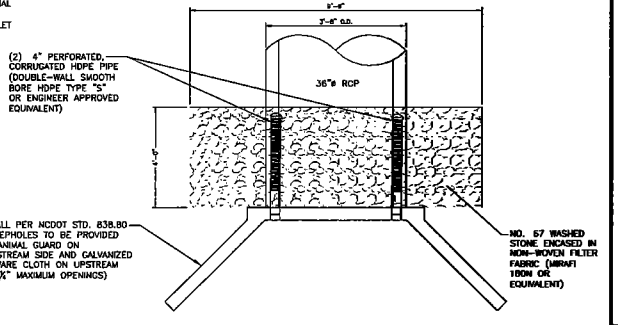


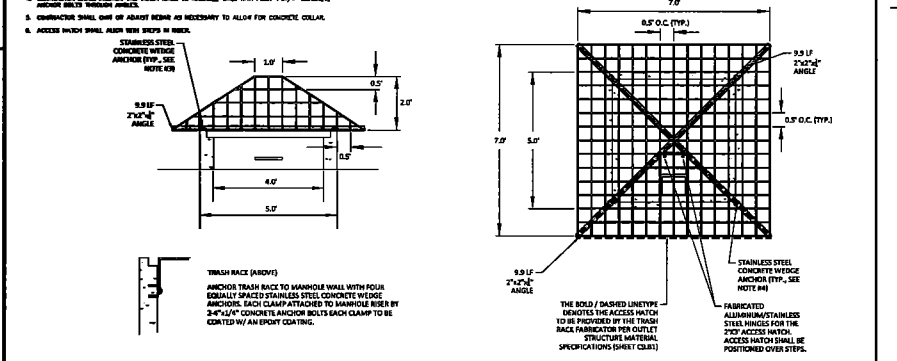
OUTLET BARREL VELOCITY DISSIPATER

N.T.S.

NOTE:

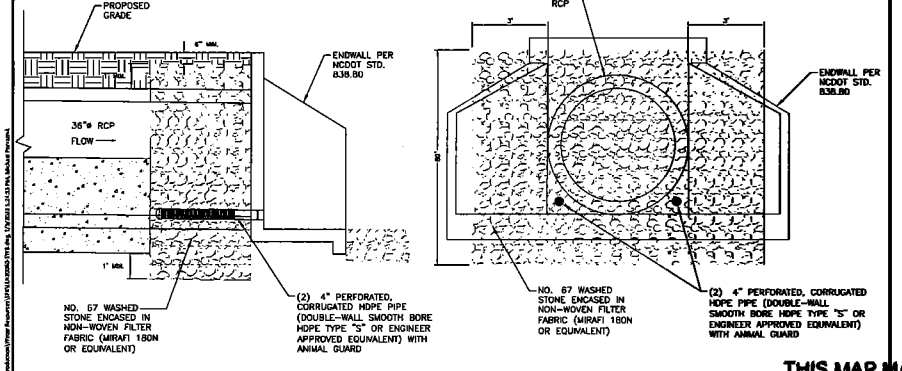
1. HAVILAND DRAINAGE PRODUCTS 4" ALUMINUM ANIMAL GUARD ITEM NUMBER ACSS04 (OR ENGINEER APPROVED EQUIVALENT) TO BE INSTALLED AT OUTLET OF 4" HDPE PIPES





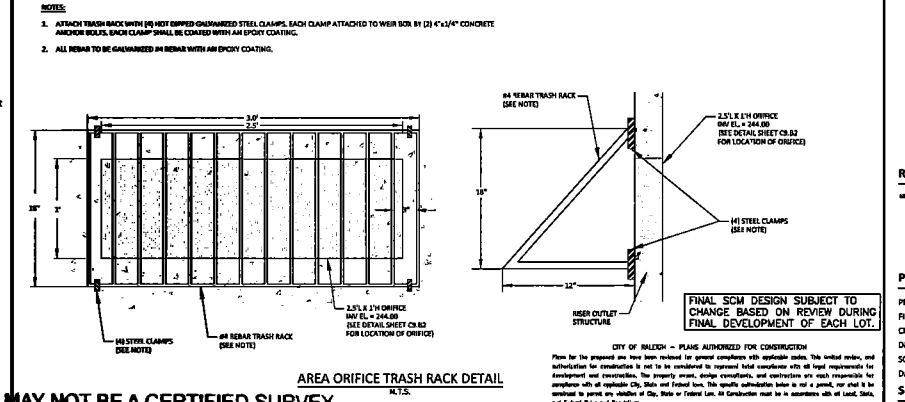
4'X4' RISER TRASH RACK DETAIL

N.T.S.



36" SPILLWAY FILTER DETAIL

N.T.S.



AREA ORIFICE TRASH RACK DETAIL

N.T.S.

FINAL SCM DESIGN SUBJECT TO CHANGE BASED ON REVIEW DURING FINAL DEVELOPMENT OF EACH LOT.

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. Any electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval: _____ City of Raleigh Review Officer

FINAL DRAWING - RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT

LENNAR
1100 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWB
CHECKED BY	RCA
DRAWN BY	MJP
SCALE	NTS
DATE	01. 05. 2022
SHEET	

STORMWATER CONTROL MEASURE "B" DETAILS

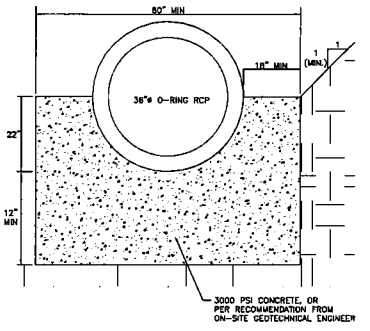
C9.B3

NOTE:

1. CONTRACTOR SHALL PROVIDE A JOINT IN THE OUTLET BARREL NO MORE THAN 5-FT FROM THE RISER.

BARREL PIPE CONCRETE CRADLE CONSTRUCTION SEQUENCE

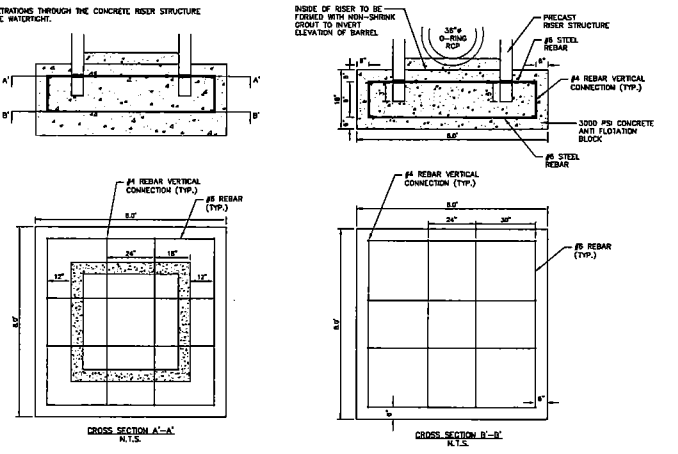
1. IF OPTION A IS CHOSEN FROM NOTE 9 OF THE OUTLET STRUCTURE MATERIAL SPECIFICATIONS, THEN BRING GRADE OF DAM EMBANKMENT TO SPRINGLINE OF PIPE ELEVATION. IF OPTION B IS CHOSEN FROM NOTE 9 OF THE OUTLET STRUCTURE MATERIAL SPECIFICATIONS, THEN CONSTRUCT FORMWORK FOR CONCRETE CRADLE ON EXISTING GRADE.
2. IF OPTION A IS CHOSEN FROM NOTE 9 OF THE OUTLET STRUCTURE MATERIAL SPECIFICATIONS, THEN EXCAVATE TRENCH FOR CRADLE AND BARREL PER DIMENSIONS ON DRAWINGS. IF OPTION B IS CHOSEN FROM NOTE 9 OF THE OUTLET STRUCTURE MATERIAL SPECIFICATIONS, PROCEED TO STEP 3 BELOW.
3. PLACE BARREL PIPE ON CONCRETE BLOCKS TO GRADE. AT THIS STEP, CONTRACTOR SHALL WRAP A DOUBLE LAYER OF NON-WOVEN GEOTEXTILE FABRIC AROUND EACH JOINT OF THE 36"ø O-RING RCP BARREL IN 2' WIDE STRIPS CENTERED ON JOINT.
4. PLACE CONCRETE FOR CRADLE FOR EACH SECTION FROM ONE SIDE OF THE TRENCH. ALLOW CONCRETE TO FILL ENTIRE AREA UNDER PIPE AND PIPE HAUNCHES AS TO LEAVE NO VOIDS UNDER THE PIPE BEFORE PLACING CONCRETE ON THE OPPOSITE SIDE OF THE TRENCH. PLACE ENTIRE CRADLE AS ONE LIFT (VERTICALLY) PER DRAWINGS.
5. CONCRETE CRADLE MAY BE ELIMINATED PER RECOMMENDATION FROM THE ON-SITE GEOTECHNICAL ENGINEER. ANY DEVIATION FROM THIS DETAIL SHALL BE SUBMITTED TO AND REVIEWED BY THE DESIGN ENGINEER PRIOR TO IMPLEMENTATION. IF THE CRADLE IS ELIMINATED, THEN A LETTER FROM AN NC PE CERTIFYING THAT ALL SOIL MATERIAL UNDER, AROUND, AND ABOVE THE BARREL PIPE MEETS THE BERM MATERIAL SPECIFICATIONS IS REQUIRED.
6. ALLOW CRADLE TO CURE FOR A MINIMUM OF 7 DAYS BEFORE ANY VIBRATING COMPACTION EQUIPMENT IS USED IN THE VICINITY OF THE BARREL PIPE.
7. TRENCH TO BE BACKFILLED IN 5" LIFTS WHEN COMPACTION IS BY HAND. BACKFILL IS IN 8" LIFTS WHEN CONDUCTED BY MACHINE. MINIMUM OF 2 FEET COVER MUST BE PRESENT ON 36"ø RCP BEFORE DRIVING OVER WITH HEAVY EQUIPMENT.



36" CONCRETE CRADLE DETAIL
N.T.S.

NOTES:

1. ALL REINFORCING STEEL IN RISER ANTI-FLOTATION BLOCK TO BE GRADE 60 #5 BARS FOR HORIZONTAL CROSSING AND GRADE 60 #4 BARS FOR VERTICAL CONNECTIONS.
2. INSIDE OF RISER BOTTOM TO BE FORMED WITH NON-SHRINK GROUT TO INVERT ELEVATION OF BARREL.
3. ALL PIPE PENETRATIONS THROUGH THE CONCRETE RISER STRUCTURE SHALL BE MADE WATERTIGHT.



RISER/ANTI-FLOTATION BLOCK CONNECTION
N.T.S.

SEEDBED PREPARATION

1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3-4 INCHES DEEP OVER ADVERSE SOIL CONDITIONS. TOPSOIL SHOULD BE INCORPORATED INTO THE FINAL GRADING OF THE BASIN SIDE SLOPES AND AQUATIC SHELF. CONTRACTOR SHOULD SCARIFY THE TOP 3-4 INCHES OF THE COMPACTED FILL TO PROMOTE BONDING WITH TOPSOIL.
2. RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. PER ONE TIME ONLY, APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL.
5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
6. SEED ON A FRESHLY PREPARED SEEDBED AND COVER.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. AFTER PERMANENT COVER IS ESTABLISHED.
9. CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT.

TEMPORARY SEEDING SCHEDULE

SEEDING DATE	SEEDING MIXTURE	APPLICATION RATE
JAN 1 - MAY 1	RYE (GRAIN)	120 LBS/AC
	KOBE LESPEDEZA	50 LBS/AC
MAY 1 - AUG 15	GERMAN MILLET	40 LBS/AC
AUG 15 - DEC 30	RYE (GRAIN)	120 LBS/AC

SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 750 LB/AC 10-10-10 FERTILIZER (FROM AUG 15 - DEC 30, INCREASE 10-10-10 FERTILIZER TO 1000 LB/AC).

MULCH
APPLY 4000 LB/AC STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE
JAN 1 - AUG 15: REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.
AUG 15 - DEC 30: REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOP DRESS WITH 50 LB/AC OF NITROGEN IN MARCH, IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/AC KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

NOTE: USE THE TEMPORARY SEEDING SCHEDULE ONLY WHEN DATE IS NOT CORRECT TO USE THE PERMANENT SEEDING SCHEDULE.

PERMANENT SEEDING SCHEDULE (DAM EMBANKMENTS)

SEEDING DATE	SEEDING MIXTURE OPTIONS (CHOOSE ONE)	APPLICATION RATE
MAY 1 - AUG 31	CENTIPEDE GRASS	30 LBS/AC
APRIL 1 - SEPT 1	SUMMER MIX (50% HULLED BERMUDA/20% MILLET)	200 LBS/AC
OCT 1 - MARCH 1	FALL MIX (80% TALL FESCUE/20% ANNUAL RYEGRASS)	200 LBS/AC

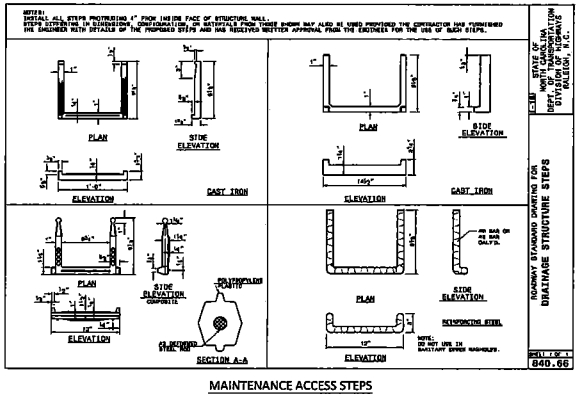
SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 1000 LB/AC 10-10-10 FERTILIZER.

MULCH
APPLY 4000 LB/AC STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

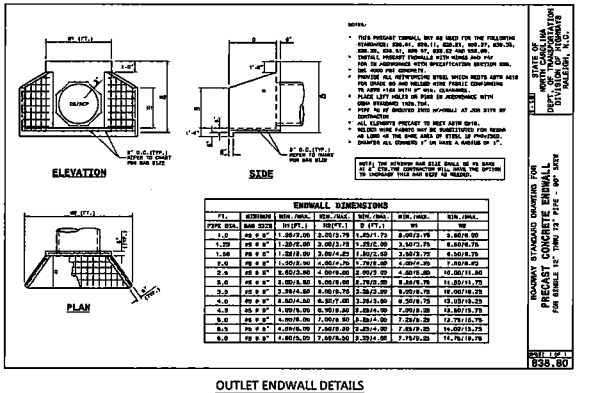
MAINTENANCE
INSPECT AND REPAIR MULCH FREQUENTLY. REFERTILIZE IN LATE WINTER OF THE FOLLOWING YEAR: USE SOIL TESTS OR APPLY 150 LB/AC 10-10-10 FERTILIZER. MOW REGULARLY TO A HEIGHT OF 2-4 INCHES.

NOTE: PERMANENT SEEDING SCHEDULE IS FOR SLOPES OF THE BASIN AND TOP OF BERM.

SEEDING SPECIFICATIONS



MAINTENANCE ACCESS STEPS
N.T.S.



OUTLET ENDWALL DETAILS
N.T.S.

THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.

FINAL SCM DESIGN SUBJECT TO CHANGE BASED ON REVIEW DURING FINAL DEVELOPMENT OF EACH LOT.

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval shall proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modifications to this approval once issued will invalidate this approval.

City of Raleigh Development Approval

City of Raleigh Review Officer

FINAL DRAWING - RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

CLIENT

LENNAR
1300 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

REVISIONS

NO.	DATE

PLAN INFORMATION

PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWB
CHECKED BY	RCA
DRAWN BY	MJP
SCALE	NTS
DATE	01. 05. 2022
SHEET	

STORMWATER CONTROL MEASURE "B" DETAILS

C9.B4

BK019403PG01161

STORMWATER CONTROL MEASURE 'B' PLANTING PLAN SPECIFICATIONS

LEGEND

QTY.	SYM.	SCIENTIFIC NAME	COMMON NAME	HATCH	TYPE	SPACING	% OF TOTAL AREA	PROVIDED AREA
LOW MARSH (SHALLOW WATER, TOTAL AREA = 5,063 SF)								
192	AC	ACORUS CALAMUS	SWEETFLAG		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 20%	775 SF
155	YC	CANNA FLACCIDA	YELLOW CANNA		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 16%	619 SF
171	NO	NYMPHAEA ODORATA	AMERICAN WHITE WATERLILY		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 18%	684 SF
162	SC	SCIRPUS CYPERINUS	WOOL GRASS		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 17%	648 SF
113	ZM	ZIZANIOPSIS MILIACEA	GIANT CUTGRASS		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 12%	452 SF
171	JE	JUNCUS EFFUSUS	COMMON RUSH		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 18%	683 SF
HIGH MARSH (SHALLOW LAND, TOTAL AREA = 5,272 SF)								
407	JE	JUNCUS EFFUSES	SOFT RUSH		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 35%	1,626 SF
171	HA	HELIANTHUS ANGUSTIFOLIUS	SWAMP SUNFLOWER		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 15%	682 SF
251	SC	SAURURUS CERNUUS	LIZARD'S TAIL		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 21%	1,002 SF
226	PR	PANICUM RIGIDULUM	REDTOP PANICGRASS		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 19%	903 SF
151	OA	ORONTIUM AQUATICUM	GOLDEN CLUB		4-INCH CONTAINER	24" O.C.	PROVIDED PERCENTAGE = 12%	602 SF

(ASSUMED 1 STEM PER 4 SF FOR ALL CALCULATIONS)

SEEDBED PREPARATION

1. CHISEL COMPACTED AREA AND SPREAD TOPSOIL 3-4 INCHES DEEP OVER ADVERSE SOIL CONDITIONS. TOPSOIL SHOULD BE INCORPORATED INTO THE FINAL GRADING OF THE AQUATIC SHELF AND BASIN SIDE SLOPES. CONTRACTOR SHOULD SCARIFY THE TOP 2-4 INCHES OF THE COMPACTED FILL TO PROMOTE BONDING WITH TOPSOIL.
2. RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. PER ONE TIME ONLY, APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL.
5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
6. SEED ON A FRESHLY PREPARED SEEDBED AND COVER.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. AFTER PERMANENT COVER IS ESTABLISHED.
9. CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT

TEMPORARY SEEDING SCHEDULE

SEEDING DATE	SEEDING MIXTURE	APPLICATION RATE
JAN 1 - MAY 1	RYE (GRAIN)	120 LBS/AC
	KOBE LESPEDEZA	50 LBS/AC
MAY 1 - AUG 15	GERMAN MILLET	40 LBS/AC
AUG 15 - DEC 30	RYE (GRAIN)	120 LBS/AC

SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 750 LB/AC 10-10-10 FERTILIZER (FROM AUG 15 - DEC 30, INCREASE 10-10-10 FERTILIZER TO 1000 LB/AC).

MULCH
APPLY 4000 LB/AC STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE
JAN 1 - AUG 15: REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

AUG 15 - DEC 30: REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOP DRESS WITH 50 LB/AC OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/AC KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

NOTE: USE THE TEMPORARY SEEDING SCHEDULE ONLY WHEN DATE IS NOT CORRECT TO USE THE PERMANENT SEEDING SCHEDULE.

PERMANENT SEEDING SCHEDULE (DAM EMBANKMENTS)

SEEDING DATE	SEEDING MIXTURE	APPLICATION RATE
AUG 25 - OCT (BEST)	TALL FESCUE	200 LBS/AC
FEB - APR 15 (POSSIBLE)		

SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 1000 LB/AC 10-10-10 FERTILIZER.

MULCH
APPLY 4000 LB/AC STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE
INSPECT AND REPAIR MULCH FREQUENTLY. REFERTILIZE IN LATE WINTER OF THE FOLLOWING YEAR; USE SOIL TESTS OR APPLY 150 LB/AC 10-10-10 FERTILIZER. MOW REGULARLY TO A HEIGHT OF 2-4 INCHES.

NOTE: PERMANENT SEEDING SCHEDULE IS FOR SLOPES OF THE BASIN AND DAM EMBANKMENT.

PLANTING INSTRUCTIONS

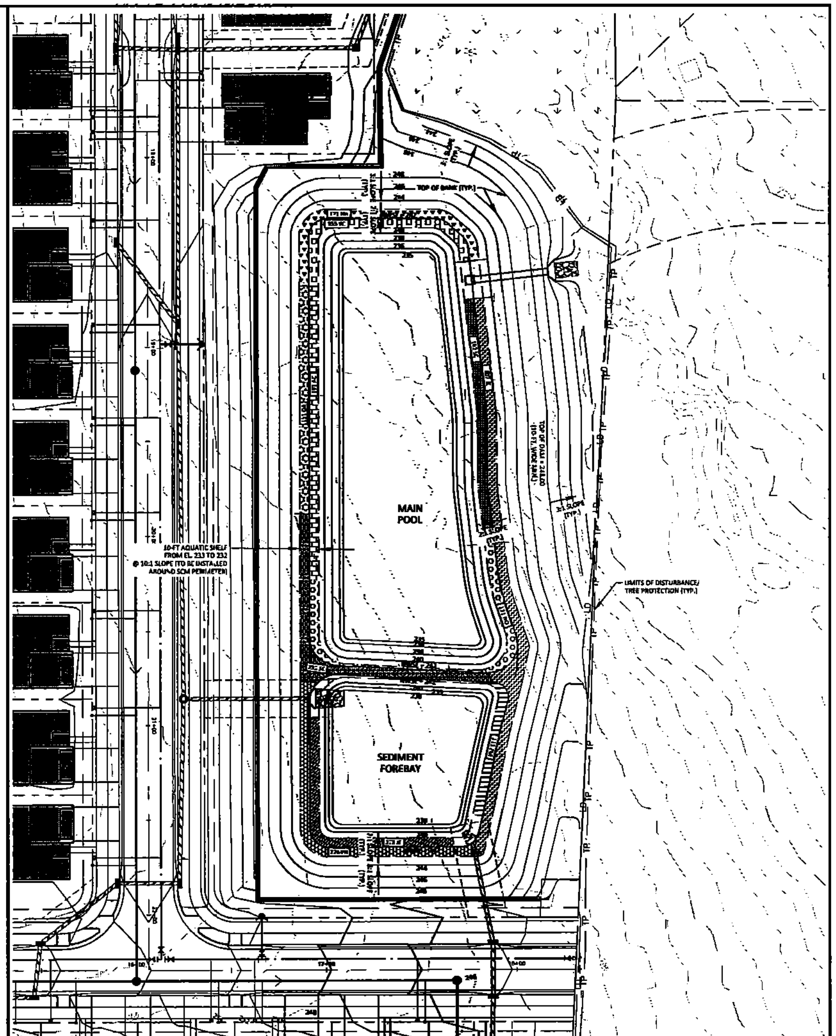
PLANTING TECHNIQUES
A. INSURE THAT ROOTS, ONCE REMOVED FROM POT, ARE STRAIGHTENED AND FACE DOWNWARD.
B. CREATE PLANTING AREA FOR EACH PLANT AND EXCAVATE PIT.
C. PLACE PLANTS IN PIT INSURING ROOTS ARE FACING COMPLETELY DOWNWARD.
D. HEEL IN SOIL AROUND PLANT AND PROCEED TO NEXT PLANTING LOCATION.
E. NEWLY PLANTED PLANTS NEED TO BE FASTENED TO THE SUBSTRATE FOR THE ESTABLISHMENT OF NEW ROOTS.
F. ROOTS SHALL BE SPREAD IN THEIR NORMAL POSITION. ALL BROKEN OR FRAYED ROOTS HALL BE CUT OFF CLEANLY.
G. THE DIAMETER OF THE PITS FOR ALL VEGETATIVE STOCK SHALL BE AT LEAST THREE TIMES THE DIAMETER OF THE ROOT MASS. PLANT PIT WALL SHALL BE SCARIFIED PRIOR TO PLANT INSTALLATION.
H. SET THE PLANTS UPRIGHT, IN THE CENTER OF THE PIT. THE BOTTOM OF THE ROOT MASS SHOULD BE RESTING ON UNDISTURBED SOIL.
I. PLACE THE BACKFILL AROUND THE BASE AND SIDES OF THE ROOT MASS, AND WORK EACH LAYER TO SETTLE BACKFILL AND TO ELIMINATE VOIDS AND AIR POCKETS. WHEN PIT IS APPROXIMATELY 2/3 FULL, WATER THOROUGHLY BEFORE PLACING REMAINDER OF THE BACKFILL. WATER AGAIN AFTER PLACING FINAL LAYER OF BACKFILL.
J. BROKEN OR DAMAGED PARTS WILL BE CUT BACK TO UNDAMAGED TISSUE, LEAVING AS MUCH GREEN BASAL TISSUE AS POSSIBLE ABOVE THE ROOTS. IF MORE THAN FIFTY PERCENT (50%) OF THE PLANT IS DAMAGED THEN CONTRACTOR SHALL REPLACE THE PLANT.

CONTAINER STOCK / BARE ROOT
A. STOCK SHALL HAVE BEEN GROWN IN A CONTAINER LONG ENOUGH FOR THE ROOT SYSTEM TO HAVE DEVELOPED SUFFICIENTLY TO HOLD ITS SOIL TOGETHER ONCE REMOVED FROM THE CONTAINER.
B. CONTAINER PLANTS WILL NEED TO BE WATERED REGULARLY AND PLACED IN SHADY CONDITIONS UNTIL PLANTING OCCURS.
C. BARE ROOT PLANTS ARE FOR IMMEDIATE PLANTING, OTHERWISE SEE D) BELOW.
D. IF BARE ROOTS SPECIMENS ARE NOT TO BE PLANTED WITHIN FOUR (4) DAYS, TEMPORARY HOLDING OF BARE ROOT SPECIMENS ARE TO BE COVERED ENTIRELY BY A SUITABLE MEDIUM (ETC. SOIL, SAWDUST, MULCH OR THE LIKE) AND WATERED REGULARLY SO AS TO NOT DRY OUT.

PLANT LOCATIONS
A. NEW PLANTINGS SHALL BE LOCATED WHERE SHOWN ON PLAN EXCEPT WHERE CHANGES HAVE BEEN MADE IN PROPOSED CONSTRUCTION.
B. NECESSARY ADJUSTMENTS SHALL BE MADE ONLY AFTER APPROVAL BY THE OWNER OR THE OWNER'S REPRESENTATIVE.

WATER
WATER SHALL BE POTABLE AND SHALL NOT CONTAIN ELEMENTS TOXIC TO PLANT LIFE.

THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.



STORMWATER CONTROL MEASURE "B" LANDSCAPE PLAN

1" = 30'

GRAPHIC SCALE
1 inch = 30 ft.

FINAL SCM DESIGN SUBJECT TO CHANGE BASED ON REVIEW DURING FINAL DEVELOPMENT OF EACH LOT.

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval ______________________

City of Raleigh Review Officer

FINAL DRAWING - RELEASED FOR CONSTRUCTION

MCADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT
LENNAR
1100 PERIMETER PARK, SUITE 112
MORRISVILLE, NC 27560
PHONE: 919. 465. 5929

LENNAR

HUNTER'S POINTE
SITE PERMIT REVIEW
4020, 4100 AND 4112 HOLDEN ROAD
RALEIGH, NORTH CAROLINA, 27616

REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO.	LEN-20060
FILENAME	LEN20060-SWB
CHECKED BY	RCA
DRAWN BY	MJP
SCALE	1" = 30'
DATE	01. 05. 2022

SHEET

STORMWATER CONTROL MEASURE "B" LANDSCAPE PLAN

C9.B5